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PARTICULARLY SUCH AS EMBRACE THE MOST RECENT

INVENTIONS AND DISCOVERIES

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No. XLIII.

Recent Patents.

To Stephen Wilson, *of Streatham, in the County of Surrey, Esq. in consequence of his own Discoveries, and Communications made to him by Foreigners residing Abroad) for certain Improvements in Machinery for Weaving and Winding.*

[Sealed 31st May, 1823.]

The first subject of this patent, (viz.) the machinery for weaving, is an improvement upon the very ingenious French loom for producing figured goods, described in our second volume, page 95, under the title of Francis Lambert's patent for "mounting and producing, and also removing, preserving, and replacing the figure in weaving, &c.," and which invention is further detailed under the patent of Stephen Wilson, page 255, of the same volume, for "certain improvements in machinery for weaving, &c." By referring to these inventions, it will be seen, that a series of pasteboards pierced with holes, to answer the draft of a certain devised pattern, are successively brought against the ends of a series of horizontal needles, for the purpose of shifting these needles, and thereby causing certain of the rods connected to the necking of the harness to be removed from the lifting bars, so as to vary the parts of the warp or chain threads raised at every throw of the shuttle, and by that means to produce the desired pattern or figure in the loom.

The present invention is a considerable improvement and simplification of the above plan, as by this new arrangement, the lifting bars heretofore employed in raising the warp, and also the guide needles, are altogether dispensed with. Plate I, fig. 1, represents the machine in perspective; it is intended to be placed upon the top of the loom, and the lines *a a* are a series of cords connected at bottom to what is called the necking of the harness, by which the warp threads are drawn up; *b b*, are the lifting rods, severally hooked to these respective cords; *c*, is called the *axe carré*, a revolving box pierced on each side with a series of holes corresponding in number and position to the top ends of the rods *b b*. An enlarged representation of a portion of the rods, hooks, and their appendages, is shewn in fig. 2.

These rods and cords pass through small holes in the several guide plates, *d*, *e*, *f*, *g*, which answer the purpose of what is called the *comber board* in other figure looms; *e* is a frame holding two thin metal plates, laid upon each other in close contact; these plates are both of them pierced with a series of oval holes corresponding. Upon each of the rods *b b* two small beads are soldered, the holes in the plates *e* being sufficiently large to permit the upper beads to pass through; but in order to prevent this during the general movements of the apparatus, the upper of the two plates *e* is slidden about the sixteenth of an inch side-ways, and kept in that situation by springs, that the oval holes may be partly closed, the rods only being permitted to slide through the openings. Small worm spings are placed upon these rods, and the lower beads rest against them, by which means the rods and the cords of the necking are all supported.

This machine is put in operation by means of the lever *h*, which is intended to be connected to the working part of the loom below, and to move with it for the purpose of actuating a vibrating frame *i i*. To this vibrating frame moving upon pivots, two sliding bars, *k k*, are attached, which extend up the sides of the machine, and at top carry the pivots of the *axe carré*, *c*.

Let it now be supposed that the lever *h* is raising the the frame *i* and the sliding bars *k k*, as shewn at fig. 1; at this time one of the pins in the end of the revolving box strikes against the under side of the spade-formed catch *l*, and causes the box to be turned round, its movement being confined to one quarter of a revolution by the two spring pieces *m m*. The *axe carré* will now stand square with its lower perforated surface facing to the ends of the rods *b b*. Upon the edges of the sliding bars *k k* there are projecting pieces, which as they rise come against the under side of the frame *e* and lift it, when a catch in the side of the standard takes hold of the frame, and confines it in the situation shewn in the figure until liberated by the descent of the sliding bars. At this time, an inclined plane acts against the side of the upper plate in the frame *e*, and by pushing it side-ways, causes the oval holes to open, so as to permit the beads to pass through when the ends of the rods are pressed. On the descent of the vibrating frame, the *axe carré* comes down upon the ends of the rods *b*; but its surface being perforated throughout, the rods would pass into the holes, and not be pressed by it, unless the holes where obstructed.

It will now be necessary to refer again to the above mentioned specifications, where it will be seen that a succession of pierced boards or cards are to be placed upon the surface of the *axe carré* or revolving box ; these cards having certain blanks, that is parts, without perforations. The blank parts of the card, as the *axe carré* descends in the present machine, striking against the end of certain of the rods, will push those rods down, and cause the beads to pass through the holes in the plates *e*, while those rods which penetrated through the perforated parts of the card are not depressed by the descent of the *axe carré*, and their beads remain above, as will be seen in fig. 3.

The opening of the holes by the sliding of the upper plate *e* being momentary, as soon as the beads have passed through the holes are again closed, and the plate *e* descends, pressing down such of the beads as are situated on the under side as *z z*, fig. 3. by which means the cords connected to these depressed rods will hang loosely.

It will now be seen that on the plates *e* again rising by the action of the vibrating lever, as explained above, the rods and cords *x x*, fig. 3. (that is those only which are above the plates *e*) will be lifted, consequently those parts only of the warp which are connected to the rods and cords *x x* will be raised in the loom, while those connected to the rods and cords *z z* will remain quiescent, until the opening of the holes again at the next descent permit the depressed beads to return, which they will do by the upward force of the worm springs; and another pierced card now acting upon the *axe carré*, will depress other rods ready to produce the figure of the next shoot in the same way.

The construction and operation of this improved machinery is much more simple, and has precisely the same effect in producing the figure or pattern in the loom as the revolving bar, vibrating lever, lifting bars, rods, and guide needles, in the French loom upon the construction above referred to.

[*To be continued.*]

To THOMAS HOPPER, *of Reading, in the County of Berks, Esq. for his Invention of certain Improvements in the Manufacture of Silk Hats.*

[Sealed 2d November, 1823.]

THE object of this patent appears to be to render the materials of which silk hats are made completely waterproof. The process though described in very learned terms appears to be not so clearly explained as might be wished, therefore least any unintentional misconception should creep into our version of the subject, we shall as nearly as possible follow the language of the original document:—

The woollen substance which forms the basis, is first to be boiled in a solution of the supersulphate of alumine and potass, (common alum) for two hours, in the proportion of two or three pounds of alum to a gallon of water. It is then to be taken out, well rinsed in clear water and wrung, and immediately dipped in a solution of isinglass or glue of variable strength, at a boiling heat, and put on a frame to dry and give it a shape.

The cloth thus prepared, and before it becomes quite dry, may be again immersed in a strong solution of the acetate or tartrate of alumine, or supersulphate, and allowed to remain in the liquor for a few hours; it may then be rinsed and dryed as before. This liquor must not be hot.

A third method is to dip the cloth (previously alumed) in a solution of gelatine, and one of the aluminous salts added together; when wrung, immerse it once or twice in an alkaline lixivium, afterwards let it be dried. By these processes, the gelatine is set or fixed in what may be termed the first, second, and third degree. In the last process, a double chemical change is effected, the acid of the aluminous salt leaves it, and attaches itself to the alkali, while its base, the alumine, combines with the gelatine and renders it insoluble in water, and together with it remains affixed to the cloth.

Various important advantages appear to be derived from the alumining process; it effectually removes the grease from the wool, by which, conjoined with its strong affinity for the cloth and gelatine, between which there exists but little naturally, it acts as a powerful intermedium in fixing the latter, enables it to resist the action of water, from the absorption of which when used in its simple state, and consequent increase of volume, arises one of the principal causes of the disjunction, and falling to powder of the resinous gums. It prevents the cloth from shrinking in any sensible degree when subsequently wetted, facilitates the adhesion of the gums with the wool, and serves to equipoise those materials that are fusible by heat.

The resinous gums may now be applied in the same manner as at present practised, or they may be used in the humid way, dissolved in spirituous menstruum, with a proportion of Venice turpentine. It is usual to mix a third or fourth part of resin or sandaric with the lac; but the mastic is preferable, not curling up in cooling like the sandaric, and possessing more tenacity than either. It contains a substance, amounting to nearly a fifth, greatly analogous to caoutchouc. Caoutchouc or elastic gum, dissolved in rectified oil of turpentine, and rendered drying by pure alumine, or by washed æther, or which is more economical, as much acetate of alumine as it will absorb: they should be rubbed together. It is, however, only intended as a partial application.

Between the resinous gums and the varnish, an intervening substance, not fusible by heat, is necessary, to prevent the latter from subsiding. Isinglass dissolved in weak spirit, gum acacia, simple or pure aluminous paste, &c. suffice.

The varnish, either that in common use, or the following, may be employed:

Asphaltum four parts, gum mastic or gum anime two or three parts, drying linseed oil from two to three parts.—Melt the bitumen and gum in an iron vessel over a charcoal fire, then add the oil; when well mixed, remove the vessel from the fire, add venice turpentine two parts, and gradually six or eight parts of essential oil: strain, if it should be too thick, when cool add more of the essential oil. The proportions here given admit of being varied.

[*Inrolled May*, 1824.]

To Thomas Peel, *of Manchester, in the County Palatine of Lancaster, Esq. for a Rotatory Engine for the purpose of communicating Motion by means of Steam, or other Gaseous media.*

[Sealed 27th May, 1823.]

The principle of this rotatory engine is the same as that of the Electrical Orrory, in which the fluid discharged at the extremities of arms strikes against the atmosphere, and by its resistance, has the effect of causing the arms to revolve in a contrary direction.

Plate I. fig. 4, is a front view of the engine, and fig. 5 a longitudinal section of the same; *a* is a boiler of any desirable form, erected upon brick-work, to which a tube *b* is attached by flanges and bolts; *c* is the hollow axle of a wheel turning in the stuffing-box *d d*; *e e e e* are hollow arms extending from and communicating with the hollow axle; *f f* is a rim merely attached to the arms for the purpose of acting as a fly-wheel, to equalize the motion.

The steam generated in the boiler *a* is intended to pass through the tube *b*, the hollow axle *c*, and the arms *e e e e*, and to blow out on the side of the arms near their extremities. The resistance which the atmosphere will present to the currents of steam, it is expected will cause a recoil against the opposite sides of the arms, and cause them to revolve in the same manner as the stars and wheels produced by fire-works are impelled round. The extremity of the axle *c* has a toothed pinion, into which it is proposed that a toothed wheel shall gear, and by means of pullies and band, or other contrivances connected to its shaft, the rotatory power of the engine is intended to be made the mechanical agent for moving any other kind of machinery.

[*Inrolled November*, 1823.]

We believe that though very many attempts have been made to effect the above object by similar means, it has never been found that the resistance of the atmosphere so employed was sufficient even to overcome the friction of the stuffing box.—EDITOR.

To Pierre Jean Baptiste Victor Gosset, *of Queen-street, Haymarket, in the County of Middlesex, Merchant, in consequence of a Communication made to him by a certain Foreigner residing abroad, for an Invention of a Combination of Machinery for producing various Shapes, Patterns, and Sizes from Metals or other Materials capable of receiving an Oval, Round, or other form.*

[Sealed 18th December, 1823.]

The subject of this patent is a mode of producing, by means of pressure, out of wire gauze or other such material, various shaped cages or wire safes for covering meat, and other purposes, whereby the article so covered may be protected from flies, and at the same time be exposed to the open air. The process is simply to place a flat piece of wire gauze over a concave vessel, and to press it into that concave by means of a corresponding convex block, so as to cause the wire gauze to assume the shape of these implements, and to retain that shape after being removed from them. Plate I. fig. 6, is a section of the apparatus; *a a* is the concave or mould; *b* the convex or block; *c c* a flat piece of wire gauze, having a hole in the middle for the screw *d* to pass through; *e* is a winch, which, on being turned, draws the block *b* and causes it to force the gauze into the concave, until the surfaces of the two implements are nearly in contact with the gauze between them.

In this situation a ring or rim of metal is to be soldered to the gauze, for the purpose of preserving its shape, and when the safe thus produced is removed from the mould, the rough edge of the gauze is to be cut or trimmed off, and, if necessary, an ornamental band fastened by solder or otherwise round the rim, and also a button or knob introduced at the central hole, for the purpose of closing it, and forming a handle

If the central hole should be considered objectionable, the operation may be performed in a different way; (viz.) by placing the screw on the reverse side of the block, and having mounted it in a frame, fig. 7, causing the convex block to be forced into the concave mould, and, by that means, press the wire gauze into the form required, and finishing it with a rim as before described.

It is obvious that a great variety of curved forms may be made in this way, by employing implements of different shapes and sizes; and the patentee states, that he only proposes to describe such machinery as may be conveniently adapted to this purpose, his invention consisting simply in "forming or producing articles of various shapes, patterns, and sizes, out of metallic wire gauze, or other suitable material as aforesaid, by the operation of pressing or forcing the said metallic wire gauze or other material into moulds or shapes of the desired form of the article intended to be produced, &c." This process, however, is not intended to be applied to the forming of any such shaped articles out of plate or sheets of metal.

[*Inrolled, February,* 1824.]

To SIR JAMES JELF, *of Oakland, near Newnham, in the County of Gloucester, Knt.; for a Combination of Machinery for Working and Ornamenting Marble for Jambs, Mantles for Chimney-pieces, and other Purposes.*

[Sealed 20th December, 1822.]

THIS is a mode of cutting any description of parallel mouldings upon marble slabs or blocks, for ornamental chimney-pieces and monuments, and other marble or stone decorations. The machinery consists of a fixed frame, on which the block or blocks are laid and secured, and of a sliding frame, to which the cutting tool is attached. This cutting tool is a plate of metal, formed with grooves and elevations, which, by repeatedly traversing to and fro with the aid of sand and water, grinds the surface of the marble slab to the form of the cutter.

Plate I. fig. 8, is a side view of the apparatus; *a* is in the description called "the vertical limb of a quadrant lever, which derives its motion from a steam engine or other power;" this, we presume, is made to vibrate by means of some mode of connection to the working part of a steam engine. The quadrant lever *a* is by means of a parallel motion, apparatus *b*, made to work the hollow cylindrical bar or shaft *c c* to and fro, in a horizontal direction, the shaft sliding in the sockets of the rests *d d; e* is the bed upon which the slab or several slabs of marble intended to be cut is to be placed and made fast.

The end view of the apparatus, shewn at fig. 9, will now best explain the operation; *f f* are the sliding plates, to the under side of which the cutting tools are affixed. These plates are connected by arms *g g* to the sliding shaft *c*, and by the motion of the sliding shaft, as above described, the plates *f f*, with the cutting tools, are slidden horizontally to and from over the blocks or slabs of marble fixed in the bed *e* below.

This apparatus has a variety of adjustable parts, by which the marble intended to be wrought may be accurately fixed, and the sliding plates are also carefully adjusted between lateral guide ribs, so that their motions may be perfectly parallel and true. By these means, with the assistance of sand and water, the traversing of the cutting tools grind or work such grooves and mouldings in the slabs as may be designed, and with a facility and truth not to be obtained by the ordinary modes of cutting such forms by hand; *h h* are levers for raising either of the sliding plates when the work is to be examined or removed, without stopping the movement of the machinery.

The sliding plates, with the cutting tools, descend as the marble or stone becomes reduced by the attrition, and the work being thus conducted with slow progression and the utmost accuracy, no strain or jar is given to the marble, and the danger of splitting the slabs, by repeated vibrations, as in the old mode, is completely avoided.

This machine is capable of cutting or grooving two slabs at one operation, which will be sufficient for twenty-four lengths of three feet each by six inches wide; it is also capable, by means of a suitable cutter, of grinding or rubbing down the surfaces of slabs to a perfect level with greater accuracy than any other machine, and for that purpose a plain flat rubber, instead of the indented one, must be employed; and it is likewise intended, under those circumstances, to permit the bed with the slabs to move upon the rollers *i i*, at which time a small excentric motion is given from the engine, in order to prevent the rubber from passing twice over the same point of the slab, and thereby prevents its being scratched by the sand.

[*Inrolled, June,* 1823.]

To RICHARD GILL, *of Barrowdown, in the County of Rutland, Fellmonger and Parchment Manufacturer, for his new Method of Preparing, Dressing, and Dyeing Sheep Skins and Lamb Skins with the Wool on, for Rugs for Carriages, Rooms, and other Purposes.*

[Sealed 24th July, 1823.]

THE skins are to be first thoroughly washed in a running stream, so as to cleanse the wool from every kind of dirt; they are then to be stretched upon frames, the extraneous or refuse portions on the edges being trimmed off. The inside of the skin is then to be well scraped with a parchment-maker's knife, for the purpose of removing the grease and flesh which may have adhered; and afterwards, keeping the back of the skin upwards, and placing the frame upon trussels, it is to be covered with a solution of sumach and boiling water, in the proportion of a gallon of water to every pound of sumach. This material is to be spread over and well worked into he skin with the knife before mentioned; by which means the skin will become tanned.

When the sumach is sufficiently dry, the reverse side of the skin is to be placed upwards, and the wool thoroughly washed with strong soap and water, and then with clean water, until the grease is perfectly removed. After having been gradually dried in the air, the back of the skin is again covered with the sumach, and, when perfectly dry, any roughness is polished down with pumice-stone.

If the wool is to be white, it must be bleached, by placing it over the fumes of sulphur in a close vessel; it is afterwards to be carefully combed out, and the face dipped in water tinged with blue. But if the wool is to be dyed or coloured, its face must be several times dipped in a suitable menstruum; an extract of fustic is proposed, but many other materials will answer the purpose, and the colour may or may not be raised with a mordant, as shall be required. The wool should then be well washed, in order to get rid of the colouring matter; and after drying, dressing, and trimming the sides of the skins, the rugs are fit for use.

[*Inrolled, September,* 1823.]

To JAMES BARRON, *of Wells Street, in the Parish of St. Mary-le-bone, in the County of Middlesex, Venetian Blind Manufacturer, and* JACOB WILSON, *of Welbeck Street, in the same Parish, Upholsterer, for their Invention of certain Improvements in the Construction and Manufacturing of Window Blinds.*

[Sealed 11th August, 1823.]

THE first part of this invention is a mode of converting ordinary venetian shade blinds into what are called bonnet or projecting blinds. Plate II. fig. 1, represents a window, to which a venetian shade blind is adapted. This blind is formed of long narrow laths, connected together by strings and tapes in the usual way, and is made to draw up and down in the grooves of a frame, fixed on the outside of the window. In this figure, it assumes the appearance of an ordinary outside blind, but by the improvement, is capable of being thrown out in the form of figure 2, so as to become a bonnet, or projecting blind.

In order to effect this, a portion of the grooved frame on each side, as *a a*, is made movable upon hinges *b b*, and when it is desired to project the blind as in fig. 2, two stretching rods are let down from the inside, as shewn by dots at *c c*, so as to support the ends of the grooved frames: the sides or fan parts *d* of the blind being formed by pieces which hang upon pivots near the hinges *b*, and are made to slide freely into their places, when the blind is projected out or drawn in.

The second part of the invention applies to that description of blind used on the outsides of shop windows, a side view of which is shewn at fig. 3; it consists of a ready mode of charging the spring roller, and of keeping the blind more out of the way of passengers; *a* is the canvas blind; *b* the box containing the spring roller upon which the canvas is wound. At the end of this box the plate is affixed, shewn at fig. 4, in the centre of which is a circular piece *z*, fastened to the end of the rod belonging to the spring; when the spring is to be charged, this piece *z* is turned round by a forked screw-driver, and then confined to the plate by screws; *c* is one of the stretching rods, having a folding joint in the middle, for the purpose of enabling the rod to fold together, and thereby occupying a small compass; *d* is the box which contains the parts about to be described, of which fig. 5 is an enlarged representation, shewing its internal parts in section; *c* is a portion of the stretching rod, projecting through an aperture in the front plate *e*, shewn detached at fig. 6. The end of this rod *c* is inserted into a square plate *f*, which turns upon a pivot, and has two friction rollers working against two springs, *g g*. It will hence be seen, that the shorter arm of the rod *c* is enabled to hang in a perpendicular position when the blind is drawn in, or to stand in a horizontal position when the blind is let out; but in order to keep the rod fast when in its horizontal position, a conical ferrule *h*, sliding upon the rod, is then passed into the hole of the front plate *e*, which confines the rod and prevents it from falling.

The third improvement applies to roller blinds, and is designed to reduce the length of the line, and the space usually taken by it, which is effected by the contrivance shewn at fig. 7; *y* is the roller; *x* is a diminished part of the roller, upon which the cord coils between two washers; when the roller turns in drawing the blind down, the cord *w* coils upon the smaller diameter, and of consequence a lesser quantity of cord is required. This part of the line is proposed to be whip cord, and to be attached to the common sized line below by means of the union screw *u*, the weight of which keeps the cord tight upon the roller.

[*Inrolled, February*, 1824.]

To JAMES SURRY, *of Battersea, in the County of Surry, Miller, for his Invention of a new Method of applying Heat for the Producing of Steam, and for various other Purposes, whereby the expense of Fuel will be lessened.*

[Sealed 4th September, 1823.]

THE patentee proposes to take advantage of the heat which is uselessly evolved in coke ovens, and to apply this heat to the generating of steam, for any purpose to which steam may be applicable, without any expense of fuel. To effect this object, he constructs metal pipes, which pass through the coke ovens from back to front, and keeps them filled with water from any convenient reservoir. These pipes becoming heated by the combustion of the gas and smoke emitted from the coal, steam is generated within, which passes off through other pipes to the steam receptacle, ready to be employed as the motive force of an engine, or for any other use.

There are no drawings accompanying this specification to illustrate the mode by which this object is attained; and indeed the patentee does not confine himself to any particular form or construction of apparatus. The ovens it is stated, may be erected in the usual way, and two or more pipes may be employed, but no very particular or definite instructions are given as to the erection; the invention consisting in taking advantage of the heat necessarily emitted in preparing coke, and applying this heat to the generating of steam.

[*Inrolled, November*, 1823.]

To SIR JOHN MARTIN HANCHETT, *of Blackfriars, in the City of London, Companion of the Most Honourable Order of the Bath, for certain Improvements in Propelling Boats and Vessels.*

[Sealed 12th April, 1823.]

IT is proposed, in the specification of this patent, that the boat or other vessel shall be propelled by the force of a jet of water, driven out at the stern, by means of a pump, which, striking against the body of water that the vessel floats in, is, by the recoil, intended to drive the vessel on in an opposite direction. It is astonishing how frequently this sort of plan has been made the subject of a patent, as a new and valuable invention, though the impracticability of the project is self-evident to every man of science. In our second vol. page 101, we have given Lilley and Frasor's Patent for Propelling Boats and other Vessels, and which is precisely the same in principle as the one now before us.

The patentee has not appended drawings to his specification, but describes the manner in which the apparatus is to be disposed and worked. He places two pipes, the one opening near the head of the vessel, the other at the stern; these are both connected to a pump, placed about the middle of the vessel, and, by the assistance of foot valves (that to the ingress pipe opening inwards, and that to the egress pipe opening outwards), he draws a volume of water in from the head of the vessel, by the rising of the pump bucket, and forces it out again at the stern, by the descent of the bucket. The openings of these pipes being at a little distance below the water's surface, permits the water to follow the vacuum in the rising of the pump-rod, and by the descent of the pump-rod; the volume of water is forced out at the stern: which by pressing against the body of water behind the vessel, is intended to produce a resistance sufficient to drive the vessel forward.

The pump is proposed to be worked by a steam-engine, placed in such a situation in the vessel as not to throw it out of its balance, or to prevent its riding in a perfectly erect position on the water; the pump itself is to work vertically, and the pipes are to be disposed in any convenient way within the vessel, not under it on the outside. There may be more than two pipes employed, and the feed or ingress pipes may, instead of laying in a horizontal position as the egress pipes, be carried directly down from the pump, and draw the water from the bottom of the vessel.

[*Inrolled, October*, 1823.]

To WILLIAM WOODMAN, *of York Barracks, Veterinary Surgeon of the 2nd Dragoon Guards, for his Invention of an improved Horse's Shoe, which he denominates the Bevelled-heeled expanding Shoe.*

[Sealed 11th September, 1823.]

THE patentee, like every other projector of a new horse-shoe, points out the disadvantages and danger to the horse attendant upon the old modes of shoeing, in which the growth of the frog is impeded, and the horse ultimately lamed through corns. If a shoe was adopted that only covered the fore part or tread of the hoof, the frog would be relieved, but the horse would be subject to frequent inconvenience, by the tender part of the foot being exposed, and by that means the horny part behind would soon become soft. The proposed shoe, therefore, in general form, does not differ from the ordinary shoe;

but the back part, that is behind what is called the bar, is on the upper side bevelled off outwardly. By this means, the bearing of the hoof is on the fore part of the shoe, that is anterior to the bar, and the hinder part of the hoof remaining unconfined, and not pressed by the shoe, allows the frog to expand and grow freely.

[*Inrolled, November,* 1823.]

To RICHARD PEW, *of Sherborne, in the County of Dorset, Esq. for a New Composition for Covering Houses and other Buildings.*

[Sealed 17th June, 1823.]

THE composition herein proposed, is intended to produce an artificial stone, and the materials of which it is to be made, are as follows: the hardest and purest limestone is to be selected; that which is most free from any admixture of sand, clay, marl, or other such matters, is very much to be preferred; statuary's marble, if it could be procured in this country, would best answer the purpose; it is therefore recommended to select that material which approaches nearest to it in point of purity, and hardness. These stones are to be calcined in a blast furnace, until all the water and fixed air, or carbonic acid is completely driven off.

Of this pure lime, when it has been reduced to a fine powder, take one part by measure, and add to it two parts of well burnt clay that has also been reduced to powder; or if burnt clay cannot be conveniently procured, powdered flints, the fine powder of lime-stone, or other hard substances capable of being reduced to powder, but such as is not soluble in water, may be employed; these are to be completely and intimately mixed together; then take one part of sulphate of lime moderately calcined, and reduced to powder, to which add two parts of the burnt and powdered clay, or other material before mentioned, and mix these together.

The two sets of powders, or compounded substances as above prepared, and in the quantities stated, are now to be combined, and well mixed, by stirring and working them for a long time until intimately united, when the composition may be considered complete, and fit for use, in which state if kept perfectly dry, and excluded from the air, it retains its virtue for a long time.

The patentee calls this composition SMALTO, or ENAMEL, and proposes to mix it with about one-fourth its weight of water, so as to produce a tolerably thick paste. It must be mixt up with the water in small quantities, as it quickly hardens, and if allowed to do so, will crumble in using, and lose its cohesive properties in a great measure. It may be spread upon laths, or any other suitable foundation, and will become as hard in time as the most durable stone, indeed, the patentee considers the substance, when properly prepared, as altogether indestructible.

Into this composition, when in a powdered or plastic state, any desired colouring matter may be introduced, which may be requisite for giving any particular hue to the artificial stone, especially in darkening the colour, which is proposed to be done generally by the admixture of lamp black, ivory black, pulverised charcoal, and several other colouring materials.

[*Inrolled, August,* 1823.]

Original Communications.

To the Editor of the London Journal, &c.

Sir,

A compound of pyroligneous acid and alcohol having been lately recommended and approved by the Society of Arts, as a desirable material for diluting the nitric acid used in *biting in* lines etched upon steel plates, I beg, through the medium of your Journal of Arts, to say a few words upon the subject.

In the first place, it is stated by the candidate in his communication to the Society, that the oxyde of iron, formed by the ordinary process of biting in, instead of being held in complete solution by the acid, forms a sediment, which settling in the lines, prevents the acid from acting on the bottom, while it continues biting the sides of them, causing the etched lines to become broad and shallow, and consequently the only remedy that can be adopted is a mixture which will not impede the action of the acid, and continue to hold the iron in complete solution, whereby the etched work would be certain of biting deep.

This is a true statement of the theory advanced, and the point said to be gained by the use of the above mixture. Let us now consider how far it agrees with the general opinion, or rather experience, which every practical engraver as well as myself has had in the pursuit of this branch of the Arts.

It is well known, or at least generally considered, that bad biting may arise from a variety of causes; for instance, from bad metal, that is impure or alloyed; from bad or imperfect ground; or from acid which has been too much diluted, or accidentally mixed with deteriorating substances; and sometimes from accident, or want of sufficient attention in the operator. But strange to say, this idea of a sediment, if any such thing has ever before been thought of, has never till now been considered as operating detrimentally, nor I think could it be so considered upon any principle of philosophy, or reason.

If, indeed, there were but one kind of bad biting, and that was shallow lines, it might, to a careless observer, seem to apply; but what can be said when some plates will scarce bite at all, even though the acid is repeatedly strengthened, while others bite altogether so quick as to ruin the whole surface, if neglected, in a few minutes. Again, some plates will bite in rough or ragged, so that the lines are like the teeth of an old mutilated saw. One plate will bite ill, and another well, with the same acid; and lastly, some will bite in partially ill, and partially well at the same time, and of course with the same acid, and under the same operator; so that I may fairly presume no single theory, however systematic or plausible it might appear, can account for the numerous and uncertain effects of biting in. Indeed, this may be learned from the circumstance, that the process for which a gold medal was given last year to the late Mr. Chas. Warren, who was really a man of science, and an excellent engraver, is now deemed incomplete, because it does not include the idea of a sediment.

Having thus far discussed the theory, we now come to the practice, in which it may be well to state, that it is proposed, to every 5 oz. of diluent (viz. 4 oz. of pyroligneous acid, and 1oz. of alcohol), there should be added 1oz. of nitric acid; whereas, to the same quantity

5oz., of the common diluent, water 100 drops of nitric acid is sufficient. From which it appears, that the diluting power of pyroligneous acid is very great, or that the mixture must be used very strong; the latter appears to be the case, for it is stated to bite in light tints in the short space of one minute, and consequently that the several shades generally requisite are produced with a celerity that gives little time for reflection, and therefore endangers the good execution of the subject at every operation; as a few seconds only will make it much darker than may be requisite, and when the dark tints are near colour, would absolutely spoil the plate. Add to which, its power is so strong, that the varnish used in common for "stopping out," seldom escapes from "biting foul," as it is technically called, and often blows up in large flakes, a most terrific sight to the artist: hence it is absolutely necessary to have some more tenacious "stopping stuff" before the proposed mixture can be used with safety; and as far as my experience goes, I decidedly prefer the operation of biting, under all circumstances, to be performed with a material that shall act slowly. Lastly, the sedimentary system has to contend with two opponents, the first of which is, that acid mixed and used in the common way, has not the least appearance of sediment, and is but slightly coloured; proving that the metal is taken up in such fine particles as to constitute a perfect solution of the metal in the acid, in which state the safety of the process, and clearness of the lines produced, can never be improved. The second is, that by the acid at present used by one of the first steel engravers in London, a great and palpable sediment is really formed, insomuch that it may be seen moving at the bottom of the acid when stirred, and in fact may be swept up to one corner of the plate like fine particles of sand, and yet he always bites in well. Query:—Where then can be the influence of an invisible sediment, unless it is argued, that the particles last mentioned are too gross to get into the lines, and thus their prejudicial effect is prevented?

As to any or what additional depth may be produced by the new mixture, I cannot at present state, as a judgment can be formed only from the repeated experiments of professional men, satisfactory results of which have not yet come to my knowledge, but that clearer lines can be produced than by other methods in common use, I positively deny; on the contrary, there is very imminent danger of "foul biting," and rough lines, and (owing to the rapidity of action,) of over biting some of the shades, as the determination to take off the acid must be almost to a moment, to which I will just add, (though in case of complete success, it would not be worth a consideration,) that the increased trouble and expense attending upon this new process, amounts to more than ten times the cost of the old method.

Having thus drawn a parallel between the principal points bearing on the subject, and compared the action of the proposed mixture with that of another, forming a great and visible sediment, and also, with one having no sediment at all, at least, so far as the eye can judge, it remains to be seen whether any better specimens of workmanship can be produced by the new process than by those "hitherto known and in use," and here we must leave it for the present, to time, and the experience of "those whom it may concern;" and with every respect for the Society of Arts, and its members, I beg leave to hint, that it might be conducive to their high reputation as a body, if in future they were to deliberate upon the propriety of bestowing their medals upon any description of quackery, at the instances of any leading members, who, from personal friendship to an individual candidate, may feel disposed to countenance projects, which they cannot practically understand, and upon which subject operating men will from prudential motives remain silent, or studiously conceal facts.

I am, Sir, your obedient servant,

CÆLATOR.

June, 1824.

To the Editor of the London Journal of Arts and Sciences.

SIR,

As the commendation which you have bestowed, (perhaps in some particulars deservedly,) upon Mr. White's "*New Century of Inventions*," induced me to become a subscriber to that work, you will perhaps allow me a page of your journal to point out a project set forth by Mr. White, but which I cannot call an invention, as I should have supposed, if the author had ever tried it, its fallacy would have induced him to throw the description behind the fire, instead of giving publicity to a self-evident absurdity.

In the fourth part of the New Century of Inventions, page 277, is an article, headed *An Hydraulic Lamp for the Table;* "I call this an Hydraulic Lamp," says Mr. White, "to distinguish it from the Hydrostatic Lamps, commonly so named; and I think the distinction proper, because this machine acts in a different manner. Its principles will be seen in a moment, by turning to the 11th figure, Plate II. If there we pour oil, or any other liquid into the bent tube, *a*, *d*, *g*; at *a*, the first effect will be to raise it to *c*, in the rising branch *b*, *c*, and from *c*, it will trickle down the branch *c*, *d*, leaving the air there to occupy its own place; continuing to pour slowly more oil into *a*, the trickling oil in *c*, *d*, will ultimately fill the rising tube *e*, *d*, expelling the air before it; and now the weight to balance the column in *a b*, will be both the colums *b c*, and *e d*; whence of course that column will rise as far above *c*, as *c* is above *b*, that is, half way between *c* and *a*. Here there would be a small deduction to be made, if the height *b c*, were considerable; but as it is only supposed to be about a foot, the compression of the air, in *c d*, &c., (being about $\frac{1}{3}$ of a foot, or $\frac{1}{90}$ of an atmosphere,) may be neglected. Continuing then to pour oil into *a*, we shall again fill, not the descending tube *e f*, but the rising tube *f g*, whose column will thus be to be added to those, *b c*, and *e d*, so that now the column *a b*, will rise to *a*, and there abide as long as the mouth *g*, is kept full, or nearly so.

"The above is the principle of the lamp announced in the title, whose effects depend then on the number of *bends* made in the tube, *a*, *d*, *g*; which number (whatever be the form) it would be well to make rather greater, than smaller, as the height *b c*, &c., might be so much the less compared with the whole column *a b*, by which means also, a smaller difference in the level of the column below, would return the oil necessary for the consumption of the wick above."

Reflecting on this said to be lamp, I was at a loss to discover how the oil, when once reduced in altitude, or consumed in the tube *a b*, was to be raised again, or its altitude maintained at the burner *a*, by the supply that might be constantly administered at the mouth *g*.

To prevent the trouble of arguing the subject upon theoretic principles, I will immediately adduce experiment; for conceiving the bare possibility that I might have overlooked some latent cause, I procured a glass tube, and bent it, agreeable to the plate in Mr. White's book, which is here represented at fig. 12; I poured the fluid in slowly, at the opening *a*, as directed, and filled the bent tube precisely as stated, leaving two columns, *c d*, and *e f*, occupied with air; I now by means of a small syphon, drew off a portion of the fluid at *a*, which I suppose will be admitted to be a fair representation of the effect of drawing off the oil by the capillary attraction of the wick, and cousuming it at the burner.

I now added more of the fluid at the mouth *g*, but was unable to raise the column *b a*, and as the syphon continued to draw off the fluid from the tube *a b*., I continued to pour into the mouth *g*. Instead of the fluid rising up to the burner *a*, which it must do if this contrivance is to produce a lamp, it ultimately settled in the situation shewn by the shaded part of the tube in fig. 12. This is a strange result after being informed by Mr. White, that "the oil in the column *a b*, *will rise to a, and there abide as long as the mouth g is kept full, or nearly so.*"

Mr. W. concludes the article by saying, "I have fully tried this method of raising oil above its level, and used for some time a lamp made on this principle, and which is still in my possession, and at some future time, I intend to bring forward an hydraulic machine, founded on the same principle."

It is scarcely possible that I should have been the only one, who has observed this anomalous project, and therefore it is not perhaps too much to expect that Mr. White will explain the last paragraph at least, if not the whole of the article.

I am, Sir,
Your's, respectfully,
W. D.

Strand, London.

To the Editor of the London Journal of Arts, &c.

SIR,

IT has been esteemed a desirable object to contrive a lamp which should have the reservoir for oil in the pedestal, and at the same time afford a constant supply at the burner, both on account of the facility it gives of making it perfectly shadowless, and of banishing the nauseous effluvia which arises when the reservoir of oil is placed near the burner. Among the latest attempts have been those of Edelcrantz and Parker (see vol. VI. page 80,) both of which, however, are subject to inconveniences, that render them all but useless. In the following plan, I have attempted to remedy those defects; what has been my success, I leave to your judgment to determine, and should it be favourable, perhaps you will oblige me by giving it publicity in the pages of your valuable Journal.

Plate II. fig. 8, is a vertical; fig. 9, a horizontal section, the letters referring to the same parts in both; *a a a a*, outer frame; *b b*, well for quicksilver; *c c*, cylindrical box, which descends into the quicksilver, and thus forms an air-tight reservoir for the oil; *d d*, toothed rods, which work in the toothed quadrants, fig. 10; these quadrants turn upon axes in the spaces *b b*, (see fig. 9,) and are such, that the length of the lever *m g*, and also the toothed arc equals the distance *n g*, (fig. 8,) and the weight *m* equals the column of oil *n g*. The weight of the box *c c* must equal the column of oil from *g g* to the burner; *e e*, tube for conveying oil to the burner; this is fixed, and passes through the top *g g* of the box *c c*, which slides upon it.

The altitude of the column of oil, above the top of the frame *a a*, being constant, it follows, that as *g g* descends, the altitude above *g g* must progressively increase, and therefore, to effect a proper counterpoise, the weight of *g g* must be increased in like ratio. Now, suppose the reservoir full of oil, as in the drawing, the rods *d d* being at their greatest elevation, the quadrants will be raised to the position in fig. 10, where the power of the weight *m* acting perpendicularly to the axis, is *nullity*; but, as the rods *d d*, or the box *c c*, which is the same thing, descend, the weight *m* will describe the arc, *m*, *o*, and consequently will progressively increase in power until it becomes horizontal, when it will have attained its maximum equal to the column of oil *n e*.

The advantages which I conceive this construction to possess over the former attempts are, that being more compact, it is less liable to be shaken in moving from place to place, and to be deranged by servants. All chance of its overflowing is removed, as the shafts (which was necessary in Edelcrantz and Parker's, to preserve the same altitude of oil above the weight or box) does not descend into the pedestal, the oil being raised by the constant weight and quadrant. In Parker's lamp, the main principle of the wick circle is destroyed, for there is no possibility of a current of air passing through the centre of the flame; this, however, is a defect easily remedied; it may be done by branching off the supply tube, as in the figure, and perforating it to admit the air. There are several minor parts of the lamp, which it is needless to describe, as they are common to all others. Mr. Parker's method of separating the oil from the mercury, by the interposition of air, a remedy by far worse than the defect, is rendered unnecessary by merely arching the top and bottom of the box; this will effectually prevent its lodging any where but in the well, and its own gravity will defy all detrimental admixture with the oil.

I am, Sir,
Your's, &c.
G. D. B.

June 12th, 1824.

American Patents.

IN our fifth vol. we gave a list of patents granted for new inventions in the United States, during the year 1820, and promised to continue the report from year to year, considering that the close connection which exists between America and Great Britain, both as respects Commerce and the Arts, would render this a feature of considerable interest. We have, however, been prevented from fulfilling our promise, not having received the report until within these few days, which circumstance will, we hope, be a sufficient apology to those of our readers who have repeatedly reminded us of the subject, and we trust that in future we shall be enabled to supply the information early in every year.

The list for 1822 has not yet arrived, but in all probability we shall receive it shortly.

Cotton Seed, application of the oil of, for all the purposes of Linseed Oil. George P. Digges, Albemarle County, Virginia, Dec. 16, 1820.

Iron Boats for navigating rivers, &c. Thomas J. Blend, Baltimore, Maryland, Dec. 21.

Double Speeder, improvement in. Paul Moody, Waltham, Massachusetts, Dec. 30.

Sleighs, improvement in. Jacob Fisher, Kennebeck Maine, Dec. 30.

Reel for spinning and making Tobacco, improvement in. Samuel and Enoch Hardy, Kennebeck, Maine, Dec. 30.

Current and Tide Mill, improvement in. Henry Allen, Fayette County, Tennessee, Dec. 30.

Steam, improvement in the application of. Aaron Miles Sabin, Frankfort, Kentucky, Dec. 30.

Boats, improvement in machinery for propelling. John James Giraud, Baltimore, Jan. 3, 1821.

Dye Wood, improvement in the machine for cutting. Elijah Converse, Dayton, Montgomery County, Ohio, Jan. 10.

Cotton, improvement in the machine for roping. Paul Moody, Boston, Jan. 19.

Wool and Cotton, improvement in the machine for roping and spinning by hand. John Brown, Providence, R. I. Jan. 23.

Razor Straps, paste for. Elisha Miner Pomeroy, New Haven, Connecticut, Jan. 24.

Corn, machine for shelling. H. Roosevelt & E. J. Roosevelt, New York, Jan. 26.

Weaving, improvement in the harness for. M. Chandler & E. Brown, Cazenovia, New-York, Jan. 26.

Plough, improvement in the, being a shifting share. John Wood, Castletown, New-York, Feb. 1.

Cordage, machine for laying, Robert Graves, Boston, Feb. 1.

Type Printing, mode of applying dry metallic and coloured powders to. George John Newberry, New-York, Feb. 1.

Glass Blowers' Mould, machine for opening. Deming Jarvis, Boston, Feb. 2.

Horizontal Pedal Water Wheel and perpendicular pivot, improvement in the. John James Giraud, Baltimore, Feb. 5.

Paddle Wheels for propelling all kinds of Vessels, machinery for geering and ungeering. B. S. Doxey, U. S. Navy, Baltimore, Feb. 9.

Water-proof Cement. Canvass White, Whitestown, N. York, Feb. 19.

Vibratory Steam Engine. Phineas Davis, York, Pennsylvania, Feb. 17.

Cotton, machine for roping and spinning. Paul Moody, Boston, Feb. 19.

Double Speeder, machine for roping cotton, called the. Paul Moody, Boston, Feb. 19.

Spinning Frame for Cotton. Paul Moody, Boston, Feb. 19.

Foot Gin for cleaning Cotton. Wm. Gould, M'Intosh County, Georgia, Feb. 20.

Lever Press. Thatcher Blake, Turner, Oxford County, Maine, Feb. 20.

Machine for Shearing Cloths. Zachary Carey, Oxford County, Maine, Feb. 20.

Lamps, improvement in, for burning fat, &c. Josiah Warren, Cincinnati, Ohio, Feb. 20.

Mantle Pieces, making of cast iron or other soft metal. Isaac Deaves, Philadelphia, Feb. 21.

Furs, Wool, &c. mode of cleaning. Daniel Vail, Philadelphia, Feb. 21.

Fire-fender, to prevent the spread of fires. Elisha Ruggles, Rochester, Massachusetts, Feb. 27.

Hydrometer, improvement in. Elijah Southworth, New York, Feb. 28.

Dry Scouring Clothes. Thomas L. Jennings, New York, March 3.

Boots and Shoes, cutting, by rule. Simeon Hart, Monkton, Vermont, March 3.

Antifriction Crank, improvement in. Benj. L. Oliver, Salem, Massachusetts, March 9.

Aqueduct Pipes, making. Thomas B. Robbins, Stockbridge, Massachusetts, March 19.

Cotton Roping, machine for making. Silas Shepard, Taunton, Bristol County, Massachusetts, March 23.

Bridle forstopping horses when running away. Peter Laporte, Louisa County, Virginia, March 20.

Candles, machine for dipping. John Aborn, Burlington County, New Jersey, March 20.

Machine for planting Corn. Andrew Cook, Flushing, Queen's County, New-York, March 20.

Carriage Wheels, improvement in hooping and turning. Russell Hunt, 2d. Litchfield County, Connecticut, March 20.

Steam Engine, improvement in. M. Ward, Columbia, S. C. March 23.

Spiral Lever Press. A. O. Stansbury. New York, Mar. 21.

Top Sled for cordage, improved. Robert Greaves, Boston, March 28.

Machine for Shelling Corn, improved. Noah Lindsey, Catskill, New York, March 28.

Machine for Protecting Firemen. Ralph Bulkley, New York, March 29.

Grain, machine for thrashing and cleaning. James Gregg, Londonderry, N. H. March 30.

Boats for Rivers, improvement in. N. C. Dawson and A. Rucker, Pedler's Mills, Amherst County, Virginia, April 3.

Cotton Goods, improvement in warping, dressing, &c. James Morgan, Baltimore, April 5.

Printing Press, improved. A. O. Stanbury, New York, April 7.

Sand, Lime, &c. machine for sifting. Evariste Blanc, jr. New Orleans, April 14.

Fanning Mill, for grain, &c. improved. Daniel Donoghoe, New York, April 15.

Land Clearing Machine. Thomas Oxley, Norfolk, Virginia, April 18.

Linen Spinning Wheel Head. Jared S. Stewart, Springfield, Ostego County, New-York, April 19.

Cast Iron Plough, improvement in the construction of. R. L. and E. A. Stevens, Hoboken, New Jersey, April 23.

Plough Shares, hardening the edge of. R. L. and E. A. Stevens, Hoboken, New-Jersey, April 23.

Riding Saddle, improvement in. Peter Dixon, Philadelphia, April 25.

Spirits, improvement in distilling. Robert Blaikie, New York, April 27.

Horse Boats, improvement in propelling. Barnabas Langdon, Troy, New York, May 1.

Carding Machine, improvement in. Joshua Woodard, Portage County, Ohio, May 2.

Printing Press, improvement in. Samuel Rust, New York, May 11.

Carpenters' Planes, improvement in. R. Willford and James H. Deas, Philadelphia, May 14.

Bricks, machine for making. Seth Belknap, Newburgh, New York, May 17.

Quills, machine for winding. Francis Jones, New York, May 23.

Fire Engine Hose, improved. James Boyd, Boston, May 30.

Pulverizing Wood, machine for. Alex. Tolson, George Town, D. C. June 2.

Morrice's Spigget and Faucet, improvement on. Jonathan Bliss, Philadelphia, June 4.

Fire Irons, improvement in. Richard Whittingham, New York, June 8.

Mode of Marking and Cutting out Clothes. Allen Ward, Huntsville, Alabama, June 16.

Mode of Packing Threads. Reuben Langdon, Hartford, Connecticut, June 20.

Liquor Fount, improvement in. John Douglas, New York, June 25.

Hay Rake, improvement in. Thomas C. Hance, Palmyra, New York, June 25.

Fulling Cloth, improvement in. Ross Winans, Warwick, Orange County, New York, June 25.

Water Boiler and Steam Still, improvement on. Stephen Stillwell, Bainbridge, New York, June 26.

Valve Cock, improvement in. Frederick D. Sahno, Philadelphia, June 29.

Staining and Printing Silks, improvement in. T. and W. Bryan, New York, June 20.

Navigable Mercantile House. R. Haskell, Geneva, New York, July 7.

Travelling Carriages, improvement in. Geo. H. Richards, New London, Connecticut, July 8.

Sail Duck, improvement in manufacturing. Josiah Chapman, Frankford, Philadelphia, July 9.

Gun Trucks, machine for cutting. R. Rose, Washington, D. C. Aug. 6.

Perpetual Proof Still. Baltazar J. Kallenbach, Philadelphia, Aug. 6.

Oblique Water Wheels. Ralph Bulkley, New York, Aug. 7.

Anti-Dyspeptic Pills. George Smith, New York, Aug. 7.

Steam Wheel, improvement in. Amos Thayer, jun. Albany, New York, Aug. 8.

Sweeping Chimneys, improvement in the machine for. J. W. Moore, Washington, D. C. August 8.

Mud Machine, improvement in. J. Eveleth, George Town, D. C. Aug. 9.

Inclined Wheel applied to churning. G. F. Reeve & Jos. Ketcham, Orange County, New York, Aug. 10.

Smut and Scouring Machine. Frederick Woodward, Butternuts, Otsego County, New York, Aug. 10.

Braiding Machine. J. Thorpe, Providence, R. I. Aug. 10.

Sail Cloth, manufacturing. James Richards, Patterson, New Jersey, Aug. 10.

Setting up Hats, machinery for. J. Grant, Providence, R. I. Aug. 11.

Whales' Blubber, machine for mincing. Benjamin Taber, Fairhaven, Massachusetts, Aug. 11.

Vertical Spinner, machine called the. John Brown, Providence, R. I. Aug. 11.

Boots and Shoes, improvement in the manufacture of. D. Peck, New York, August 14.

Horses, curing blindness in. Joseph Sater, Huntsville, N. C. Aug. 14.

Lamps, improvement in. Jas. Dukes, New York, Aug. 15.

Saw Mill, improvement in. John Bruff, Somerset County, Maryland, Aug. 16.

Cloth, machine for teasling and knapping. Aaron Foster, Whitestown, New York, Aug. 24.

Plough, improvement in the cast iron. Obadiah Seely, Pottstown, Pennsylvania, Aug. 27.

Saddles, improvement in making. John T. Morris, New York, Aug. 28.

Dry Docks, improvement in. Ralph Bulkley, New York, Aug. 28.

Portable Ice Preserver. Enoch Powers, Hartford, Connecticut, Aug. 28.

Wool, &c. improvement in the machine for spinning. W. Bushnell & J. Altoffer, Harrisburg, Virginia, Aug. 30.

Machine for raising water by weight. J. Altoffer & W. Bushnell, Harrisburg, Virginia, Aug. 30.

Thrashing Machine, improvement in. Benjamin Cumings, Brooklyne, New Hampshire, Sept. 1.

Nails, machine for cutting and heading. Thos. Morgan, Hempstead, New York, Sept. 5.

Distilling, improvement in the apparatus for. Henry F. Fisher, Philadelphia, Sept. 12.

Cast Iron Plough, improvement in. Wm. Falconer, New York, Sept. 13.

Rice, improvement in the machine for thrashing and cleaning. Michael Morrison, Waterbury, Conn. Sept. 15.

Nails, improvement on the machine for cutting and heading. George Thomson, Philadelphia, Sept. 15.

Repeating Rifle. Isaiah Jennings, New York, Sept. 22.

Cocks for drawing liquor, improvement in. Jonathan Bliss, New York, Sept. 24.

Water Cement. David M. Randolph, Richmond, Virginia, Sept. 26.

Candles, improvement in making. Francis Fuller, New York, Sept. 29.

Razor Strops, improvement in. John M. Fors, Baltimore, Oct. 2.

Right and Left Chain Wheel. R. Bulkley, N. York, Oct. 8.

Preventive for Smoky Chimneys. Frederick Crey, Baltimore, Oct. 8.

Machine for cleaning Rice, &c. Lazarus Ruggles, New York, Oct. 12.

Machine for packing Cotton. John Cooke, Fayetteville, N. C. Oct. 12.

Stone bottom Boiler. Benj. Simonds, jun. Bedford, Mass. Oct. 15.

Oven-door Flue. B. Simonds, jun. Bedford, Mass. Oct. 15.

Chains for Cables, improvement in. Josiah Jennings, New York, Oct. 29.

Floating Dry Docks, improvement in. Edward Covenhoven, Greensburgh, N. Y. Oct. 30.

Bedsteads, improvement in. D Powles, Baltimore, Oct. 31.

Sliding Door locks and bolts. T. Whaley, N. York, Nov. 2.

Ladies' Reticules, &c. improvement in. W. Winning, New York, Nov. 7.

Fire Grates, called the Caloret, improvement in. Charles M. Graham, New York, Nov. 10.

Canals, &c. machine for digging. John Humes, Richmond, Va. Nov. 10.

Ban Boxes, machine for cutting the tops and bottoms of. Benj. Mestayer, New York, Nov. 13.

Metallic Reeds for Weavers, improvement in. Peter Frs. Herbin, Patterson, N. J. Nov. 15.

Hand irons, improvement in. W. Pye, New York, Nov. 16.

Rail-ways, improvement in. C. Williams, Boston, Nov. 16.

Elastic floor for propelling boats. Oliver Phelps, Lansing, N. Y. Nov. 17.

Plough, improvement in. O. Phelps & G. Moorehouse, Lansing, N. Y. Nov. 17.

Bark Mill, improvement in. E. Trask & J. Trask, Sangerfield, N. Y. Nov. 22.

Boilers for Steam Engines, improvement in. Thos. Skidmore, New York, Nov. 11.

Condensers of Steam Engines, improvement in. Thomas Skidmore, New York, Dec. 1.

Candles, making by machinery. James M. Yard, Trenton, N. J. Dec. 4.

Chemical Anti-dysenteric Medicine. John G. Vought, Rochester, N. Y., Dec. 4.

Sliding Sector, &c. improvement in. Gabriel H. Thompson, Boston. Dec. 4.

Hulling and Shelling Rice, machine for. Elihu Spenser, Newhaven, Conn. Dec. 5.

Bedsteads, improvement in. Peregrine Williamson, Baltimore, Dec. 6.

Medicated Steam Bath, machine used for. B. Marshall, New York, Dec. 7.

Washing Machine, improvement in. James Barron, Norfolk, Va. Dec. 7.

Setting Saw Teeth, improvement in. W. Hart, Campden, S. C. Dec. 7.

Cotton Yarn, making without the aid of twist. Erastus Walcott, Newport, N. Y. Dec. 11.

Loom, improvement in. Edmund Warren, New York, Dec. 21.

Threshing and winnowing wheat, machine for. Seth Ballon, Livermore, Maine, Dec. 12.

Raising Water, improvement in the method of. Nicholas N. Dettrehan, Charles' Parish, Louisiana, Dec. 13.

Steam Boilers, improvement in. Stephen Baker, New York, Dec. 13.

Trunnels, &c. for Ships, improvement in making. Thos. Rowell, Hartford, Vermont, Dec. 13.

Ornamenting Cloth, &c. improvement in. Jas. C. Wood, Philadelphia, Dec. 14.

Horizontal Water Wheel, improvement in. Horace Howard, Worster, Ohio, Dec. 26.

Grass Bonnets, improvement in manufacturing. Gurdon Wells and Sophia Wells, Wethersfield, Hartford County, Conn. Dec. 29.

Cast Iron Plough, improvement in. D. Hitchcock, New York, Dec. 26.

Water-proof Boots and Shoes, improvement in. Aaron Dana, Boston, Mass. Dec. 31.

Cupola Furnace, improvement in. Henry Worral, New York, Dec. 31.

Corsets, improvement in. William James Cantello, New York, Dec. 31.

Clocks, improvement in the machinery of. W. Dean, Pleasant Valley, Duchess County. N. Y. Dec. 31.

The laws of the United States have hitherto prevented any foreigner from obtaining a patent in America, until he had been resident two years in that country; this law has, during the present session of Congress, been rescinded; as also the extraordinary law which limited such grants to original inventions, that had not been practised, or made known in any other country. The importation of inventions from Europe is therefore now countenanced and protected by patent-right, which will probably be the means of introducing many valuable inventions from England, and other parts of Europe, to which the American government heretofore held out no encouragement.

Novel Inventions.

Perkins's Engine.

We understand that Mr. Perkins having been assisted by Mr. Martineau and Mr. Galloway as manufacturers, has now upon the point of completion several large engines, intended to be employed in steam vessels, and within a few days it is expected they will be in operation, as their erection on board the vessels only waits for the sealing of a new patent, which Mr. Perkins is soliciting, for a peculiar kind of paddle, which is to be made the propelling agent.

Extraordinary Engine for Propelling Vessels, &c. without the Aid of Steam.

A Mr. Samuel Brown has just constructed a very curious engine, to be employed as the actuating principle of machinery, instead of the steam-engine. It is put in operation by the agency of fire, water, and air. It consists of many parts, and is not altogether free from complication, but at present we see nothing in its principles inimical to philosophy, and have no doubt it will act, though as to its power, and operating cost, as compared to the steam-engine, we have no very favourable opinion. In our next, we hope to be able to describe it more fully, and with a plate.

Destroying Bugs by Steam.

A Mr. Sealy, of New York, has lately invented a mode of destroying bugs by steam. He employs a boiler about the size of a small tea-kettle, which is placed upon a portable furnace or chafing-dish, so as to allow the apparatus to be carried about by the hand. The liquor in the boiler may be spirits of any kind, or water, the latter will generally answer the purpose. When used, the liquor must be made to boil, and its steam to flow out of the pipe or spout, which being directed to the crevices inhabited by the vermin, and held there a short time, both the bugs and their eggs will be completely destroyed.

The boiler is proposed to be made of copper, or tin, and to hold about half-a-gallon, or even less will do. The higher the steam, that is, the greater the rapidity with which the liquor boils, the more certain will be the effect of the operation.

The inventor has proposed the boiler to be hung upon pivots in the furnace, that it may be the more readily turned in any way, so as to direct its spout to that part of the bedstead or wall where the vermin herd together; and beside destroying bugs, it is considered that the same process of steaming is also applicable to the destruction of other insects. Such an apparatus may likewise be usefully employed as a fumigator, in which case vinegar, alcohol, or any other purifying liquor may be employed instead of water, and by means of the furnace, a vapour may be driven off for the purpose of clarifying the air of sick rooms, hospitals, cabins of ships, &c.

Allaying the Dust on Roads.

Mr. Gilmore, of Newcastle upon Tyne, has proposed a mode of allaying the dust on roads, and in streets; we are not perfectly in possession of his plan, and therefore shall forbear making any comments upon its practicability, but as far as we at present understand the inventor, he proposes to strew the road with salt, or to wash it with a solution of salt in water, and as salt possesses great absorbent properties, he conceives that as long as it remains on the surface it will imbibe sufficient moisture from the atmosphere to keep the dust of the road from rising. According to the results of some experiments, which have been made upon a road in the

North of England, of which the inventor is surveyor, he considers that once washing or covering the road in the way that he proposes, will, in general, be sufficient to prevent the dust from rising for nearly six weeks, and that the cost of this application will not amount to more than one quarter the expence of the ordinary mode of watering roads.

Polytechnic and Scientific Intelligence.

ROYAL SOCIETY.

[Continued from Vol. VII., page 316.]

April 8th. (Addendum)—Sir Francis Shuckburgh, Bart., was admitted a Fellow of the Society.

April 29th.—E. H. Lushington, Esq. and the Rev. Dr. E. Maltby, were admitted Fellows, and as Woodbine Parish, Esq., was unable to attend, his name was ordered to be inserted in the printed lists of the Society. A portrait of Mr. Smeaton, the Engineer, bequeathed by his daughter, Mrs. Dixon, was among the presents received.

A Letter from Dr. Tiarks, to Dr. T. L. Young, For. Sec. R.S. as Secretary of the Board of Longitude, was read, relating chiefly to observations made on the Longitude of various places in England, in the years 1822 and 1823.

May 6th.—Lieutenant H. Forster, R. N. was elected into the Society, and immediately admitted a Fellow, on account of his early departure with Captain Parry, in the new expedition.

The reading of a paper was commenced, " On Univalves, by Charles Collier, Esq. Staff Surgeon," communicated by Sir James M'Gregor, Bart. F.R.S.

May 13.—The Earl of Orford, the Rev. Dr. Good-enough, Phillip Barker Webb, Esq., and John Gage, Esq. were admitted Fellows of the Society.

Mr. Collier's paper was concluded, and a paper was read, "On the variation of the rates of Chronometers with the density of the atmosphere." By George Harvey, Esq. F.R.S.E. Communicated by Davies Gilbert, Esq. V.P.R.S.

May 20th.—The Rev. Baden Powel, was admitted a Fellow of the Society.

A letter from Professor Berzelius to the President was read, containing the results of various chemical researches, which have recently occupied his attention. The first memoir on the subject relates to the Carlsbad waters; the next, researches on the combinations of acetic acid with oxide of copper: in the analysis of this salt, Prof. B. considers he has pointed out the errors into which Mr. Phillips and other chemists have fallen. The subject of the next was the various experiments on the compounds of oxide of uranium; which have established the results of those by Mr. Arfwedson's, and also the existence of phosphoric acid in the uranite discovered by Mr. Phillips. Having examined the uranium of Autun, and also that of Cornwall, the former he finds to be a phosphate of uranium and lime, and the latter a phosphate of uranium and copper, both containing the same quantity of water. The next memoir is occupied with the account of the examination of a mineral from an old collection at Stockholm, labelled from "Mendip near Churchill, Somersetshire." It consists of one atom of chloride of lead, 2 atoms of oxide of lead, besides carbonate and molybdate of lead. It differs from the murio-carbonate of Matlock. The remaining memoir relates to the combinations of fluoric acid.

The process of obtaining the base of Silicon in an insulated state, as discovered by Professor B. consists in acting by potassum on dry silicated fluate of potash; the product being well washed with water, yields hydroguret of Silicon; it is then subjected to heat in a crucible, the hydrogen flies off, and the Silicon remains pure. The results of various experiments on this substance are then given, from which it appears, that its combustibility varies according to its aggregation, resembling carbon in this particular; it may be partially consumed in atmospheric air, or oxygen gas, in the state in which it is usually obtained; but its complete combustion is attended with considerable difficulty. Silica is formed of 200 parts of Silicon, united to 208 parts of oxygen; after detailing a variety of experiments, he states, that although the term fluate has been used instead of fluoride, throughout the communication, he does not mean to insinuate the truth of his own theory on the subject in preference to that of the ingenious President; but, writing in a language foreign to him, was desirous of employing those terms which he considered were easiest understood. His request that it may be laid before the Society concludes the paper.

The beginning of a paper was read "On some Phenomena effected by magnetic influence, by J. H. Abrahams, of Sheffield." Communicated by Mr. Tooke, F.R.S.

SOCIETY OF ARTS.

Continued from Vol. V. page 272.

In the interval between our last account of the proceedings of the several committees of this Society, and the day of the distribution of the rewards adjudged, they have respectively been engaged in the investigation of the following subjects.

Committee of Polite Arts.—On a fountain pen formed of two quills, one inserted into the other, and a piece of muslin closing the end of the inner one as a valve.—A new mode of embossing wood, by depressing portions of the surface with punches of any kind of pattern, and then filing down the prominent parts of the original surface to a level with the indentations, when the wood is to be immersed in warm water, which causes the depressed parts to resume their original height.—A white paint composed of pulverized gypsum and gum water.—Some fine specimens of engine-turning for preventing the forgery of bank-notes; and a mode of preventing fraudulent alterations in bankers' cheques.

Committee of Manufactures.—On a method of preventing the watering of plain silks in the loom.—Cloth made from cotted wool.—A suggested improvement on the French or Lyons' silk loom.—Specimens of plat from British grass, in imitation of Leghorn straw plat.

Committee of Colonies and Trade.—On fine wool imported from New South Wales.—An apparatus for eradicating the stumps of trees.

Committee of Mechanics.—On a set of working drawings of a steam engine.—An improved mode of supplying the boilers of high pressure engines.—An improvement in the construction of steam engines.—A drag or forceps for raising the bodies of drowned persons on the principle of the lazytongs.—An expanding last for the purpose of stretching shoes.—An improved mode of cutting a ship's anchor.—A heel-strap for top-masts to prevent injury from the fid.—A truss girder, in which the arch is made of cast-iron, and the chord or tie of wrought iron. A mode of ascertaining a ship's leeway, in which, by a combination of wheel-work, the angle formed by a float over the stern is shewn at the binnacle.—A method of extracting particles of steel from the eyes of dry-grinders and others by the application of a magnet.—Cast-iron drains.—Revolving heels for boots and shoes.

Committee of Chemistry.—On an alloy for castings, composed of iron 5 parts, copper 85, nickel 65, zinc 55.—Improved crucible for casting.—On lining iron tanks with a thin coating of Roman cement to prevent oxidation.—Stop-cocks for chemical purposes, the whole of the passages of which are lined with platina.

The Rewards adjudged by this Society were presented 26th May, at the King's Theatre, in the Haymarket, to the respective Candidates, by His Royal Highness the Duke of Sussex, President, in the following order:

IN AGRICULTURE AND RURAL ECONOMY,

To Philip Hurd, Esq. Kentish Town House, for raising oaks for timber, the large gold medal.

To Henry Blyth, Esq. Burnham, Norfolk, for embanking 253 acres of marsh land from the sea, the large gold medal.

To Messrs. Cowley and Staines, Winslow, Bucks, for cultivating 12 acres of poppies, and obtaining therefrom 196℔ of opium, Thirty Guineas.

IN CHEMISTRY.

To Mr. R. W. Dickinson, Albany Brewery, Kent Road, for a machine for clearing beer while in fermentation, the large silver medal.

To Mr. H. Wilkinson, 12, LudgateHill, for an improved safety chamber to the oxyhydrogen blowpipe, the large silver medal.

To Mr. T. Griffiths, Church-street, Kensington, for an improved stop-cock for chemical purposes, the silver vulcan medal.

To Mr. G. Chapman, of Whitby, for a mode of consuming the smoke of steam-engine boilers, the large silver medal.

IN POLITE ARTS.

Original Oil Painting.—To Mr. E. Knight, jun. Covent Garden Chambers, for a landscape, the gold Isis medal.

To Mr. J. P. André, jun. 5, York-place, City-road, for a landscape, the silver Isis medal.

To Miss A. Robertson, Tweedmouth, Berwick, for a portrait, the silver Isis medal.

To Miss A. Eggbrecht, 16, Frith-street, Soho, for a portrait, the silver palette.

To the same, for a composition in still-life, the silver Isis medal.

To Miss Jesse Robertson, Tweedmouth, Berwick, for a landscape, the silver palette.

To Mr. Evan Williams, 6, Charlotte-street, Bloomsbury, for a portrait, the large silver medal.

To the same, for a composition in still-life, the large silver medal.

To Mr. Henry Johnson, 7, Rodney Buildings, New Kent-road, for a portrait, the silver Isis medal.

To Mr. H. Pearsall. 13, King's-wood Terrace, Bath, for a landscape, (a composition) the large silver medal.

⁂ The two last gentlemen are deaf and dumb.

To Mr. J. M. Gilbert, 9, Hope-square, Clifton, for a view of shipping, the gold Isis medal.

To Mr. J. Eggbrecht, 16, Frith-street, Soho, for a composition in still-life, the silver Isis medal.

(*To be continued.*)

EXPLOSION OF THE AMERICAN STEAM VESSEL, ÆTNA.

WE scarcely need to apologize for the postponement of several papers which were prepared to occupy the Polytechnic part of our Journal, when we introduce the following very interesting article, upon the above melancholy catastrophe, which has this day (28th June) come to hand through the Philadelphia National Gazette.

"When the public mind is under any strong excitement, especially if it be that of fear, it is incapable of receiving the suggestions of truth and reason with calmness and consideration; but such violent emotions gradually subside, and reason resumes her government. The late melancholy disaster, on board the steam boat Ætna, has sunk deep into the public feeling, and produced an agitation unequalled on any similar occasion. The cause of the misfortune was naturally first sought for, and as it happened in a boat having what is called a high pressure engine, it was at once assumed that the whole mischief arose from the use of this machinery, without reflecting that coincidence does not always prove cause and effect. The clamour against steam boats on this construction has been eagerly encouraged and inflamed by persons, whose motives cannot be misunderstood; but a just and generous community, when their agitation subsides, will not be unwilling to consider that a number of their fellow citizens have embarked an immense capital in this property, and before they suffer them to be ruined by those who have a clear and important interest in destroying them, they will candidly listen to such facts which ought to have an influence in deciding the question, whether the catastrophe so much deplored was really owing to the construction of the boat in which it took place.

"It is my intention briefly to state and examine a few plain questions connected with this subject, by a reference to known and unquestioned facts; and to shew that, whether we turn to reason or experience, the result is, that the high pressure engines are at least as safe, and, as both are now used, probably safer, than the low pressure. We must not be misled by the terms *high* and *low* pressure, which, no doubt, have had much efficacy in misleading the public; they must be considered in relation to the strength opposed to them. The *high* is weaker, in relation to a boiler constructed to resist twice its force, than the *low*, in relation to a boiler made for half its force.

"1. Was the Ætna lost by reason of the high pressure of her steam?

"I do not undertake to state with certainty how this accident was produced; some chemical investigation will probably unfold it; but I think it can be demonstrated that high steam had nothing to do with it. It is a fact, that the boilers of the Ætna were carefully examined and cleaned but a few days before the accident, and found in excellent order, by engineers entirely competent to judge of them. It is a fact, that the boat, at the time of the explosion, was going with but 18 revolutions of her wheels in a minute, whereas her ordinary speed required 21 or 22, at which rate she has run for years without injury. There is satisfactory reason to believe, that the boiler which burst was exhausted, or nearly so, of water, and, of course, had but little steam in it; and, indeed, the slow motion of her wheels may be accounted for by her wanting the steam of one boiler. The pipe which conducted the water to feed the middle boiler, which exploded, was about two feet in length; and, for the purpose of passing round a flue, was crooked; this pipe has since been found entirely stopped with a hard substance, derived from the sea water passing through it evaporating by the heat. To the stoppage of this pipe, I believe, the whole disaster may be traced; its form and diameter were proper and sufficient for fresh, but not for salt water. It requires a scientific knowledge I do not possess, to ascertain the manner in which this cause produced the dreadful effect, and to ascertain what would be the effect of an intense heat applied to a small quantity of confined water, in decomposing it, and producing a gas fatal to life. Every one knows, that in all steam boats it is thought a matter of extreme danger to let the water get too low in the boilers. I am credibly informed, that no hot water issued from the burst boiler; that the persons killed were not scalded or wet, nor any of the furniture of the cabin, but the deaths seem to have been effected by suffocation from some foul and deadly air. This was particularly the case with the infant which was sleeping in the birth of the after-cabin, where surely no water reached. If these facts are correctly stated, the conclusion is irresistible, that the pressure of the steam had no agency in the accident; but the same causes would have been followed by the same effects in an engine of any construction or pressure.

"2 Can we pronounce the high pressure engines to be more dangerous than the low, by reasoning on their respective constructions? The answer to this enquiry is decidedly favourable to the high steam. The Bolton and Watt's engines are calculated to bear a pressure of about seven pounds to the square inch; and are declared to be safe while kept within this limit; but they are actually worked in our boats under a pressure of from ten to twenty pounds. The boilers of the high pressure engines are tried and proved to bear a pressure of from five to six hundred pounds on the square inch; and are actually worked with but one hundred and fifty. The result is that the former are under a pressure twice or thrice as great as they were intended to have on them, and the latter with but one third or fourth the pressure they have been able to sustain. These facts appear by the certificates of scientific and experienced engineers taken in 1817 under the direction of our City Councils. Are not then these engines or boilers safer with a pressure of 150 pounds, than the others with 20, or 15, or even 10. It being true that the high pressure boats really use but one third or less of the force their boilers will bear, their owners cannot have the least objection to submitting to the restriction or regulation proposed; that is, that they shall be tried and proved at certain periods, and be permitted to carry only half the pressure thus proved. Indeed, to Mr. Vaux's circular in 1817, proposing to make a trial of the strength of the boilers of the Ætna, the proprietors replied that they were "not only willing but anxious to have the trial made as soon as convenient to the committee." Whether the owners of other boats were equally willing to submit to the ordeal, I do not know.

3. If this be the correct theory of the safety of these engines respectively, has it been contradicted by experience? Have boats on the high pressure been more liable to burst than those on the low? The Ætna has run in the Delaware for about ten years without injury or accident to any body; and the Pennsylvania has run for about six years with the like good fortune; indeed, with such perfect ease and safety did she bear the pressure, that she run for two seasons without losing one trip, going sixty miles every day. Had the Ætna continued here, or had her feeding pipes been enlarged to be suitable to the salt water, there is no reason to doubt she would have continued to go on without accident as heretofore. Nor, on the other hand, has experience shewn

an exemption of the low pressure boats from bursting their boilers:—witness the *Atalanta*; the *Bellona;* the *Eagle,* a few weeks since going into Baltimore; and the *Thistle,* a few days ago, since the Ætna; besides others more distant.

But it is pretended, that even if the high pressure be no more likely to burst than the low, yet when it does take place, the danger is infinitely greater; that in fact there is no danger whatever to the passengers in the bursting with low steam. One gentleman has said, the difference is the same as between chalk and gunpowder. What says experience on this point? A rupture of the boiler has taken place on board both the *Pennsylvania* and *Ætna,* without the least injury or alarm to any body. In one case the water issued forth and extinguished the fire; in the other the steam escaped from the boiler, which was speedily repaired, without injury. These instances are all sufficient to prove, that the bursting of the boiler of a high pressure engine is not necessarily attended with violence and danger. It is not always gunpowder. Nor is the steam of the other boats always chalk. It cannot be forgotten, that when the *Atalanta* burst, two boys were killed, who were returning from or going to school. When the *Bellona* burst her boiler, several persons perished; the exact number I do not recollect, nor is it material. As to the latter disaster to the *Eagle,* a low pressure engine, it was equal or greater in destruction and force, to that of the Ætna. A passenger of the *Constitution* describes the *Eagle* as being "*a complete wreck.*" Captain Robinson gives this account of it: He saw the Eagle enveloped in smoke, and making signals of distress. 'I ran down to her, and, shocking to 'relate, when I got alongside, was informed that one of the boilers had bursted; one man, a United States' soldier, was killed, *who was lying in a berth in the forward cabin.* Mr. Murray, an eminent lawyer of Baltimore, very dangerously scalded; Captain Weems and three or four of his crew, were also severely scalded.' The Eagle was on fire, and Captain Robinson says, that, without relief, 'she would in a very short time have been burned to the water's edge, and every soul on board must have perished.' He proceeds, 'the Eagle had cast iron heads in her boilers. The after-head of the starboard boiler bursted into atoms; a piece of the cast iron went through the after cabin as far as the ladies' cabin, tearing every thing away before it; the main body of the boiler went forward to her very bows, which killed the soldier in the forward cabin. I never saw so complete a wreck below decks.' This is a fine specimen of the chalky nature of low pressure.

"The damage resulting from an explosion does not depend upon whether it is done by high or low steam, but upon the part of the boiler which gives way. If it be a mere rent, no damage will generally be done; but if the heads be blown out, which may equally happen to both pressures, the danger will be extreme.

"5. Are we to conclude from these details that all steam boat navigation is so dangerous, that it should be discontinued? By no means. They show that vigilance and care is necessary in steam boats, as in every thing else, and that, even with vigilance and care, accidents cannot be certainly and absolutely prevented. When a man once gets off his legs for transportation, he will be exposed to more or less danger. He must trust himself with powerful animals, occasionally wild and ungovernable, or in vehicles, propelled by means he cannot always control. A steam boat accident has something terrifying in it; it happens near us; the sufferers are generally numerous ; but were we to collect the injuries received from horses and carriages in a given time, they would be found more dangerous.

"How is it in comparison with ship navigation? I may safely say that in the wrecks of the *Albion*, the *New York* (sunk by an iceberg), and the *Paris*, there was a greater destruction of human lives and property, than by all the steam boats in the United States, from the commencement of their running, including a period of above sixteen years.

"Let every caution be used in constructing the engine of both high and low pressure, and frequent examinations be made of their strength and condition, and steam boats will be found to be the safest, as well as the most easy, cheap and expeditious means of conveyance."

"JUSTICE."

From experiments on steam, lately performed by Mr. Perkins, it has been discovered that explosions do sometimes take place by the decomposition of water. Mr. P. is of opinion, that many of the fatal accidents which have taken place in *low*, as well as *high pressure* boilers, have been produced by an explosion of GAS, and not by STEAM pressure. Mr. P. feels himself borne out in this conclusion, from certain facts, which we will now state. It has been before noticed in this Journal, that Mr. P.'s method of generating steam, is by heating his water in a coiled tube, under pressure, and afterwards forcing it into a very strong iron tube, which he calls the receiver, where it flashes into steam. The valve that confines the water in his generating tube, is loaded with a much heavier weight than the valve which confines the steam in the receiver. Now, if the feed pump be stopped, the water in the coiled tube will also cease from supplying the receiver, the steam, at the same time, escaping from under its loaded valve. When the steam gets so weak in the receiver by its diminished density, as not to raise the valve, the remainder will soon form an explosive gas, which will, when the ignition takes place, rend the receiver, although the safety valve is only loaded at 1000lb. at the same time, it would withstand a steam pressure of 30,000lb. upon every square inch.

This kind of explosion is too instantaneous to be relieved by *any safety valve*. Several of these accidents have taken place in Mr. P.'s furnaces without the smallest injury, excepting that of spoiling the tube. The fact is, Mr. P.'s vessels are so extremely strong, and the quantity of gas so very small, that the elastic power is exhausted in producing the fracture. These gas explosions never took place while the engine was at work, they happened while experimenting with the steam-gun, in consequence of the frequent stopping of the feed pump, and the receiver consequently became red hot from wanting its regular supply of water.

In a note from Mr. Perkins, just received, we have the following remarks: "When I first heard of the accident on board the Ætna, I felt persuaded, that it was not the effect of steam pressure that had produced the explosion, as I am well acquainted with the boilers in that vessel, I once had the satisfaction of witnessing the effects of an explosion by steam on board the Ætna, on her passage down the Delaware, and it was only known to the passengers, by the progress of the engines being stopped."

We cannot help again congratulating the public on the perfect safety of Mr. Perkins's method of generating steam, which from the above statements appear to be decisively satisfactory, whether a fracture in the vessels shall be occasioned by either steam or gas.

New Patents Sealed, 1824.

To John Dickinson, of Nash Mill, in the parish of Abbotts Langley, in the county of Hertford, Esq. for his invention of a method of cutting cards by means of machinery; and also a process for applying paste or other adhesive matter to paper; and for sticking paper together with paste or other adhesive matter, by means of a machinery applicable to such purposes.—Sealed 20th May—6 months for Inrolment.

James Cook, of Birmingham, in the county of Warwick, gun-maker, for his invention of certain improvements in the method of making and constructing locks for guns, pistols, and other fire-arms.—Sealed 20th May. — 6 months.

Thomas Marsh, of Charlotte-street, Portland-place, in the county of Middlesex, saddler and harness-maker, for his invention of an improvement in the art of making saddles.—Sealed 20th May—2 months.

To James Viney, of Shanklin, in the Isle of Wight, Colonel in the Royal Artillery, for his new invented method of supplying water or fluids for domestic or other purposes, in a manner more extensively and economically than has hitherto been usually practised.—Sealed 22nd May—6 months.

To Benjamin Black, of South Molton-street, in the parish of St. George, Hanover-square, in the county of Middlesex, lamp manufacturer, for his invention of an improvement in carriage lamps.—Sealed 25th May—6 months.

To Joseph Wells, of Manchester, in the County Palatine of Lancaster, silk and cotton manufacturer, for his new invented machine for dressing and stiffening and drying of cotton and linen warps, or any other warps that may require it, at the same time, the loom is working either with the motion of the loom or other machinery. —Sealed, 25th May—6 months.

To James Holland, of Fence House, in the Parish of Aston, in the County of York, Shoemaker, for his invention of certain improvements in the manufacture of boots and shoes.—Sealed 31st May.—2 months.

To John Heathcoat, of Tiverton, in the County of Devon, Lace Manufacturer, for his invention of certain improvements in the methods of preparing and manufacturing silk for weaving and other purposes.—Sealed 15th June.—6 months.

To William Ainsworth Jurup, of Middlewich, in the County of Chester, Salt Proprietor, and William Court, of Manor Hall, in the County of Chester, Esq. for their invention of an improved method of manufacturing salt. —Sealed 15th June.—2 months.

To Richard Hooton, of the Aqueduct Iron Works, Birmingham, in the County of Warwick, Iron manufacturer, for his invention of certain improvements in manufacturing wrought iron.—Sealed 15th June.—6 months.

To William Harwood Horrocks, of Stockport, in the County of Chester, Cotton Manufacturer, for his new invented apparatus for giving tension to the warp in looms.—Sealed 15th June—6 months.

To Robert Garbutt, of the Town of Kingston upon Hull, Merchant, for his invention of an apparatus for the more convenient filing of papers and other articles, and protecting the same from dust or damage, including improvements on, or additions to the files in common use.—Sealed 15th June.—6 months.

To Wiiliiam Harrington, of Crosshaven, in the County of Cork, Esq. for his invention of an improved raft for transporting timber.—15th June.—6 months.

To Charles Chubb, of Portsea, in the county of Southampton, ironmonger, for his invention of improvements in the construction of locks.—15th June.—2 months.

To Benjamin Ager Day, of Birmingham, in the connty of Warwick, Fire Screen Maker, for his Invention of certain improvements in the manufacturing of drawer, door and lock knobs, and knobs of every description.—15th June.—2 months.

To John McCurdy, of New York, in the United States of America, but now of Snow-hill, in the City of London, Esq. in consequence of a communication made to him by a certain foreigner, for an improved method of generating steam.—15th June—6 months.

To Philip Taylor, of the City Road, in the county of Middlesex, engineer, for his invention of certain improvements in apparatus for producing gas from various substances.—15th June—6 months.

To John Gibson, woollen draper and hatter, in Glasgow, for his new invention in the manufacturing or making of an elastic fabric from whalebone, hemp, and other materials combined, suitable for making into elastic frames or bodies for hats, caps, and bonnets, and for other purposes; and also the manufacturing or making of such elastic frames or bodies from the same materials, by the mode of plaiting.—15th June—4 months.

To William Bailey, the younger, of Lane End, Staffordshire Potteries, manufacturer and ornamenter of lustre ware, for his invention of an improved gas consumer, for the more effectually consuming the smoke, arising from gas burners or lamps.—15th June.—2 months.

D.	H.	M.	S.	
1	0	0	0	☉ declination 23° 7′ 22″ N.
1	0	43	0	♃ passes the meridian, declination 22° 17′ N.
1	4	12	0	☽ passes the meridian.
1	19	0	0	♀ in conj. with μ in Gemini
1	23	27	0	♀ Passes the merid. dec. 23° 36′ N.
3	2	31	0	☽ in □ first quarter.
6	0	0	0	☉ dec. 22° 41′ 55″ N.
6	8	23	0	☽ Passes the meridian.
7	4	0	0	☽ in conj. with σ in Scorp.
8	6	0	0	☽ in conj. with ϑ in Oph.
8	8	0	0	☽ in conj. with B. in Oph.
9	23	0	0	☽ in conj. with 1 γ in Sag.
10	0	0	0	Eclipsed partly visible at Greenwich. Beginning of Eclipse 15h. 25½m. Middle . . . . 16 9½ End . . . . . . 16 53½ Digits eclipsed 1° 37′¼ on the ☽ southern limb, or from the northern side of the ☉'s shadow.
10	4	0	0	☽ in conj. with ο in Sag.
10	6	0	0	☽ in conj. with ♅ long. 13° 30′ in Capri. ☾ lat. 22′ N. ♅ lat. 25′ S. diff. lat. 47′
10	6	0	0	☽ in conj. with η in Sag.
10	16	20	0	Ecliptic opposition ☉ full moon.
11	0	0	0	☉ dec. 22° 6′ 38″ N.
11	12	38	0	☾ passes the meridian.
12	13	0	0	♀ in conj. with δ in Gemini.
13	0	6	0	♃ passes the merid. dee. 21° 53′ N.
13	23	43	0	♀ passes the merid. dec. 23° 2′ N.
16	0	0	0	☉ dec. 21° 21′ 52″ N.
16	16	7	0	☾ passes the meridian.
18	13	0	0	♀ in conj. with ♃ long. 23° 52′ in Cancer ♀ lat. 48′ N. ♃ lat. 16′ N. diff. lat. 32′
18	16	0	0	☾ in conj. with η in Pisces
18	19	57	0	☾ in □ last quarter.
21	0	0	0	☉ declin. 20° 28′ 1″ N.
21	5	0	0	☾ in conj. with η in Taurus
21	7	0	0	☿ in conj. with ♃ long. 24° 24′ in Cancer, ☿ lat. 1° 19′ N. ♃'s lat. 16° N. dif. lat. 1° 3′
21	20	8	0	☾ passes the meridian.
22	11	49	0	☉ enters Leo.
24	5	0	0	☿ in conj. with ♀ long. 52° 43′ in Cancer, ☿ lat. 1° 33′ N. ♀ lat. 57′ N. dif. lat. 36′
24	16	0	0	☾ in conj. with δ in Gemini.
25	7	0	0	☾ in conj. with ♃ long. 24° 55′ in Cancer, ☾ lat. 1° 24′ S. ♃'s lat. 17′ N. diff. lat. 1° 41′.
25	19	9	0	Ecliptic Conjunction ● New Moon.
25	23	26	0	♃ passes the merid. dec 21° 27′ N.
25	23	57	0	♀ passes the merid. dec. 20° 52′ N.
26	0	0	0	☉ dec. 19° 25′ 32″ N.
25	0	9	0	☽ passes the meridian.
26	21	0	0	☽ in conj. with ξ in Leo.
27	1	0	0	in conj. with ο in Leo.
27	9	0	0	☽ in conj. with π in Leo.
31	0	0	0	☉ dec. 18° 15′ 1″ N.
31	4	34	0	☽ passes the meridian.

Rotherhithe. J. LEWTHWAITE.

The waxing moon ☽—the waning moon ☾.

METEOROLOGICAL JOURNAL, MAY AND JUNE, 1824.

1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	—	
MAY					
26	64	45	30,36	30,26	. .
27	69	43	,48	—,45	. .
28	75	39	,46	—,37	. .
29	69	40	,25	—,06	. .
30	66	49	29,85	29,77	. .
31	69	45	,86	—,79	0125
JUNE					
1	69	45	30,14	30,02	. .
2	72	43	,23	—,22	. .
3	63	47	,25	station	. .
4	69	43	,26	—,23	. .
5	62	42	,21	—,14	. .
6	71	48	,14	—,12	. .
7	71	49	,11	station	. .
8	73	44	,07	30,00	. .
9	73	44	29,95	29,89	. .
10	55	48	,90	—,88	. .
JUNE					
11	59	46	30,06	29,99	,95
12	63	35	,10	30,08	. .
13	64	34	,06	29,90	. .
14	63	47	29,50	—,30	1,0
15	58	52	,35	—,20	,125
16	67	42	,56	—,45	. .
17	65	50	,90	—,67	.125
18	65	40	,97	—,90	. .
19	57	44	,74	—,47	. .
20	63	51	,43	—,35	,175
21	68	52	,49	—,45	,075
22	71	43	,52	station	. .
23	62	49	,40	—,38	,025
24	55	51	,46	—,36	,925
25	62	50	,78	—,57	,875

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

Dr. Brewster, having seceded from the Edinburgh Journal of Philosopy, is about to publish a new work upon a similar plan, in quarterly numbers; which is to be entitled The Edinbugh Journal of Arts and Sciences. From the prospectus, which has fallen into our hands, containing the names of contributors, and the subjects announced, we have every reason to expect a work of considerable interest; and though there are so many of a similar kind, the name of the editor is enough to warrant the expectation, that this will be no inconsiderable acquisition to science.

M. Cuvier, the celebrated naturalist, has lately presented a Memoir, addressed to the Academy of Sciences, at Paris; exhibiting the present state of knowledge in the science of natural history, the details of which are highly interesting. Linnæus, in 1778, reckoned nearly 8,000 species of plants; there are now above 40,000 noticed. Buffon estimated about 300 quadrupeds; they are now increased to above 700, and the catalogue is still considered incomplete. M. de Lacepede, who, twenty years ago, wrote a History of the Known Species of Fish, did not enumerate more than 1,500; and there is now contained in the Cabinet of the King of France alone, above 2,500. M. Cuvier considers this number but a small proportion of what may be yielded by the seas and rivers. The immense number of insects is truly surprising, above 25,000 species are reckoned, and they are continually augmenting, by the collectioms of travellers in hot climates.

A microscopic work of M. Strauss, on the Maybug, shews that that animal, not exceeding one inch in length, contains 306 hard pieces as, envelopes; 494 muscles; 24 pair of nerves; and 48 pair of trachea.

Mr. Maugham, author of the Pupil's Pharmacopœia, is printing, uniformly with the Phar. Lond. an Appendix to that work, comprising a concise History of the Materia Medica, and the preparations contained therein; with a brief notice of their doses, virtues, and uses.

The lately discovered work of Milton, is about to be printed at the University Press of Cambride, and will be published together with a translation, under the immediate sanction of His Majesty; the work will be of some magnitude as the M.S. consists of above 700 pages.

A Treatise on the Zoology of Mexico, by Mr. Swainson, is in the press, it will contain descriptions of the animals lately collected there by Mr. Bullock, and is intended as an appendix to the travels of that gentleman.

Mr. John Edward Gray is preparing for publication, by subscription, a series of the Genera of Mollusca; illustrated with plates of each section, and of all the new species. The work, when completed, will form a history of all the known species of fossil, shell, and molluscous animals. Each part will form a complete work of itself, and may be subscribed for separately, as it will be furnished with indexes, and an arranged list of the strata of the Fossil species, &c.

GREEK CHRONICLE.—A newspaper has been established in Greece, printed from the types presented to the Greeks by the late Lord Byron; it is under the superintendance of a German, M. Mayer; and it professes to treat on political news, debates in the senate, foreign correspondence: morals and legislation, and of the advancement of, and discoveries in the arts, sciences, and manufactures, and foreign intelligence connected with Greek literature.

The Geographical Society of Paris, which has been instituted only two years, has greatly forwarded this important and beneficial science; the first volume of its proceedings contains some valuable communications from remote parts of Asia, and the interior of Africa, as well as from several parts of the new world. The second volume comprises, the enquiries of travellers who are about commencing journies to distant countries, to obtain such information from the Society, as may render their travels more useful to science. Among those about to set forward are Messrs. Buisson d'Armandy, and Ch. de Sauvigny, both members of the Society; the first to Moca, and the latter to Calcutta. The honorary rewards, offered by the Society, are of considerable value; medals of from 3000 Francs to 500 to be presented on the completion of Journies with a manuscript for the use of the Society for publication.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLIV.

Recent Patents.

To SAMUEL BROWN, *late of Windmill-street, Lambeth, in the County of Surrey, but now of Printing-house Yard, Blackfriars, in the City of London, Gentleman, for his new invented Engine or Instrument for effecting a Vacuum, and thus producing power by which Water may be raised, and Machinery put in motion.*

[Sealed 4th December, 1823.]

THIS is an hydro-pneumatic engine, partaking of the principles of Savery's and Newcomen's steam-engine, and also of some modifications of the same principles subsequently introduced by others; but instead of condensing steam within the cylinders to effect a vacuum, the exhaustion is here to be produced by ignited gas, issuing from jets, which by consuming the air in the closed vessels, permits the superincumbent atmosphere to force water up tubes into the vacuum chambers, and flowing thence into the periphery of a bucket water-wheel, is thereby intended to give a rotatory power for the purpose of actuating other machinery.

Plate III. exhibits the general appearance of an engine constructed upon these principles: *a* and *b* are two cylindrical vessels, in which vacuums are to be alternately effected; *c* and *d* are two pipes which may be called the rising mains, leading from the reservoir *i*, at bottom, to the cylinders *a b*, at top. Through these pipes the water will rise into the cylinders respectively, when the vacuums are effected.

Inflammable gas from a gasometer situate at any convenient distance, is to be conducted through the pipes *e* and *f*, the latter of which passes into the cylinders and terminates in the jets or burners *g*, which are perforated with holes; while the pipe *e*, extends to small openings with sliders *h h*, in the side of the cylinders *a* and *b*, immediately opposite to which, within the cylinders are latteral jets, communicating with the burner *g*.

In order to put this engine in action, the well or reservoir *i*, at bottom must be filled with water, which by passing through the pipe *j*, into the vessel *k*, and into the rising main *c*, will cause the float *l*, to ascend, and by forcing up the rod *m*, will elevate that end of the engine-beam, marked *n*. In rising, the beam will lift the cover or cap *o*, off the top of the cylinder *b*, and at the same time bring down the cap *p*, at the reverse end on to the cylinder *a*, as shewn in the figure.

The gas is now to be turned on in the pipes *e* and *f*, by opening the stop-cocks; and the jets at both ends of the pipe *e*, near *h h*, are to be set fire to. The ascent of the rod *m*, has now by means of an arm *q*, lifted the slider *h*, on the side of the cylinder *b*, and opened the aperture; by which means the flame of the jet *e*, instantly communicates through the aperture to the burner *g*, and causes the gas to take fire within the cylinder.

In the upper part of the apparatus there is a small cylindrical glass vessel *r*, more than half filled with mercury, which vessel is made to vibrate upon pivots, and as the rod *m*, ascends or descends, two small arms *s*, attached to the rod *m*, take hold of a pin in the side of this vessel *r*, and by that means raise and depress its end alternately; when the mercury within flowing to the lower side, gives an impetus to its descent, which by chains and rods move certain minor parts of the engine, as will be explained hereafter.

The cylindrical vessel *r*, in falling over, as shewn in the figure, has, by means of a rod or chain *t*, connected to it, drawn the slider *v*, in the well over the mouth of the pipe *j*, and closed it, at the same time opening the mouth of the pipe *u*, by which means the water is permitted to flow through the pipe *u*, into the vessel *w*, and also into the rising main *d*, thereby causing the float *x*, to ascend and lift the rod *y*, which raises the end of the beam marked *z* and also the cover or cap *p*, off the top of the cylinder *a*, at the same time depressing the reverse end of the beam marked *n*, and causing the cap *o*, to close the cylinder *b*, and keep it air-tight.

In the descent of the end of the beam *n*, last mentioned, the rod *m*, is brought down, which by means of the arm *q*, shuts the slider *h*. The gas now burning, as above said, in the closed cylinder *b*, consumes the air and causes a vacuum therein, to occupy which, the water instantly rises in the main *d*, and flows over the top into the cylinder *b*, which becomes nearly filled, the rarefied air escaping from the cylinder through small valves in the cap.

While this operation is going forward in the cylinder *b*, the returning stroke of the beam and the mercury vessel *r*, have passed the slider *v*, from the mouth of the pipe *j*, over that of the pipe *u*, when, as the water ascends into the cylinder *b*, the float *x*, is permitted to descend, and at the same time the water entering the pipe *j*, the vessel *k*, and the rising main *c*, lifts again the float *l*, the rod *m*, and the end of the beam marked *n*, which brings down the reverse end *z*, placing the cap *p*, on the top of its cylinder *a*, as in the figure. During the progress of this movement of the machinery, the flame of the jet *e*, has passed through the aperture *h*, to the burner *g*, within the cylinder *a*, and set fire to it, then the slider *h*, becoming closed in the manner before described, the burning gas within the vessel produces an exhaustion, and the water flows up the main *c*, and occupies the cylinder *a*, in the same manner as the cylinder *b*, above explained.

In order to raise the caps off the cylinders after their exhaustion, it is necessary to admit a portion of air, which is done by means of a slide-valve in the air-pipe A; this valve is worked by chains B B, attached to the floats *l x*, and as these floats ascend and descend, the slide-valve at A is passed to and fro, so as to admit the air alternately into the vacuum chambers *a* or *b*, immediately after the water has risen. Chains C C, attached to the ends of the mercury vessel and to the stop-cocks in the gas-pipe *f*, with weights suspended, are by the vibration of that vessel alternately made to turn the gas off, and on, in the burners *g* in *a*, and *g* in *b*, which is essential, in order to afford a regular supply, as well as to prevent an unnecessary consumption.

The water raised by these means is retained by the foot valves D D, occupying the mains, and the jackets or outer cases of the cylinders, which keeps the interior cool, while the greater portion of that received into the cylinders, passes off through pipes E E, to the trough F, from whence it descends by a sluice on to the periphery of a bucket water-wheel G G G, to which it gives a rotatory motion, and by means of gear of any sort being attached to the axle of this wheel, the power of the engine is to be communicated as an actuating principle to any other machinery.

When an engine of this kind is to be employed for raising water, the wheel is to be dispensed with; the well at bottom is to be immersed below the surface of the pool, and the water raised to be discharged by trunks or otherwise from the trough F.

A piston may be worked upon the principle of producing a vacuum beneath it, by burning the air in the way above described; and this may be done in a distinct vessel, so as to communicate with several cylinders, and consequently to work several pistons at the same time, the air and vacuum valves being opened and closed by similar means to those adapted to work the induction and eduction valves of steam-engines.

The patentee does not claim as his invention the particular construction of the machine exhibited in the figure, his principles being capable of extension and modification in various mechanical ways, and which are applicable to the production of power, either to raise water, or other purposes. The claim of the patentee, therefore, is limited to his mode of effecting a vacuum by burning gas in a vessel, and thereby consuming the air within.

The advantages to be derived from the engine above described, are stated to be—

"First—The quantity of gas consumed being very small, the expense of working the engine is moderate. In its application on land, the saving will be extremely great; the cost of coal gas (deducting the value of the coke) being inconsiderable; and although the expense of working a marine engine will be greater, as the gas used for that purpose must be extracted from oil or some other body equally portable; yet even then, it will not equal the cost of the fuel required to propel a steam-boat; and, as a few butts of oil will be sufficient for a long voyage, vessels of the largest tonnage may be propelled to the most distant parts of the world.

" *Secondly.*—The engine is light and portable in its construction, the average weight being less than *one fifth* the weight of a steam-engine and boiler of the same power; it also occupies a smaller space considerably, and does not require the erection of so strong a building, or of a lofty chimney. In vessels, the saving of tonnage will be highly advantageous, both in the smaller comparative weight and size of the engine, and in the very reduced space required for fuel.

" *Thirdly.*—This engine is entirely free from danger; *no boiler being used.* Explosion cannot take place, and as the quantity of gas consumed is so small, and the only pressure that of the air, it is impossible that the cylinder can burst, or that the accidents incidental to steam-boats can occur.

" The power of the engine (being derived from atmospheric pressure of from nine to ten pounds on the square inch) may be increased, with the dimensions of the cylinders, to any extent, and always ascertained by the application of a mercurial gauge.

" It is scarcely necessary to allude to the well-known fact, that, after deducting the friction arising from the use of the air and cold-water pumps, &c. &c. the general *available* power of the condensing steam-engine is, from seven to eight pounds per square inch.

" The cost of the machine will be less than that of the steam-engine, *particularly as constructed for raising water;* it is, therefore, peculiarly adapted for draining fens, &c. or supplying reservoirs. The expense of wear and tear will also be trifling, and when occasionally out of order, it may be repaired at a very inconsiderable cost, and with but little delay."

[*Inrolled, June,* 1824.]

In noticing this engine in our last (page 36,) we were induced, upon considering its theory, to insinuate a doubt, as to the capability of its successfully competing with the steam-engine, and though our opinion is at variance with most respectable testimony upon that subject, we are not yet fully prepared to retract, but shall pay every attention to the progress of the invention, and from time to time, state, without reserve, the actual effects of its operation.]

EDITOR.

To SIR WILLIAM CONGREVE, *of Cecil-Street, Strand, in the County of Middlesex, Bart. for his Invention of various Improvements in Fire-works.*

[Sealed 16th October, 1823.]

THE first improvement proposed under this patent, is to combine a parachute with a rocket, for the purpose of suspending in the air any complicated piece of firework, such as the Chinese Drum, or any other device, when carried up and discharged by the rocket. The parachute is to be contained in the body of the rocket, and when the rocket explodes, the parachute being liberated, will suspend the fire-works during the remainder of the discharge, by which means very beautiful effects may be produced in the air.

This plan may also be applied to suspend signals, and maintain them for a much longer time than the transitory appearance of the star rocket usually employed; this will be particularly desirable in taking observations connected with geometrical surveys. It may also be used to throw a strong light upon any distant object, such as an enemy's camp, or a vessel in chase at night, by suspending a strong Bengal light to the parachute,

In carrying up this parachute and its appendages, it is intended to place it in the hinder part of the rocket, for the convenience of delivering it at any point of its ascent, and for this purpose the fire is made to issue in front, and to reverberate by a hollow cone or cylinder, or through vents opening in the rear By these means the whole of the piece of fire-work with its parachute, may be constructed in a very compact form, and will be certain of descending clear of the rocket. This improvement may be also combined with the common rocket, so as to form a double rocket upon the same axis.

The second improvement consists in a mode by which the length of the rocket guide stick may be reduced to one half or less; this is done by attaching to the end of the reduced stick, several projecting narrow planes made of tin, similar to the feathers of an arrow, but slightly twisted as a rifle barrel. These planes are connected together by a ring or tube, and are so attached to the stick, that they are enabled to revolve as the rocket advances, which action compensates for the reduced length of the stick; and the stick itself may be connected to the rocket, in the common mode, or in the centre, as in the war rocket. If these wings or feathers were attached to the body of the rocket, and there made to revolve behind the vent, the stick might be altogether dispensed with.

The third improvement is a mode of regulating the time of discharge, or bursting of the rocket; this is done by connecting the exploding charge to the rocket by a small wooden cylinder or collar, in the circumference of which various length of fuzes are introduced, and this collar being turned round, the fire of the rocket may be made to communicate to a fuze calculated for one, two, three or any other number of seconds duration, according as circumstances may require, to regulate the time at which the explosion shall take place.

The fourth improvement is, a mode of producing instantaneous fire, for the discharge of fire-works, instead of the ordinary port-fires to the leaders. For this purpose the end of the leader is to be armed with one of the self-igniting paper crackers, or matches made of fulminating silver and powdered glass, the paper case of which being suddenly torn asunder, gives an instantaneous spark. The composition contained in this match must be surrounded with a small quantity of mealed powder, made of oxymuriate of potash, or other rapidly inflaming material, communicating with the end of the common leader, so that sufficient fire may be produced to make the leader strike, as it is difficult to make the spark thus produced ignite common gunpowder.

In this way the different parts of a piece of fire-works may be instantaneously lighted in succession, by putting strings connected with matches to the ends of the leaders. There is nothing new proposed in these self-igniting matches or crackers, but merely their application to the discharge of the trains or leaders of fire-works or fire-arms generally, which in all cases would be found to be less expensive than the lock and flint, and more rapid than the port-fires.

[*Inrolled, April,* 1824.]

To **Rupert Kirk**, *of Osborn-street, Whitechapel, in the County of Middlesex, Dyer, for his Invention of a new Method of Preparing or Manufacturing a certain Vegetable Substance, growing in parts abroad, beyond the Seas, and imported to and used in these Kingdoms as a Dye or Red Colouring matter for the use of Dyers, called Safflower (Carthamas) so as more effectually to preserve its Colouring Principle from Decay or Deterioration in its Passage from the Place of its Growth to England and other parts of Europe*

[Sealed 20th March, 1824.]

The patentee proposes that he or his agents shall make the extract of Safflower near the place of its growth abroad, by similar means to those usually employed for extracting the red colour from that plant. When this is done, a suitable quantity of cotton, flax, wool, or other such material, shall be immersed in this extract, for the purpose of taking up the colouring matter, and then the said cotton, flax, wool, &c. shall be dried, so as to evaporate the aqueous parts of the extract, leaving the colour in a dry state, adhering to the material. In this condition the cotton, flax, or wool, is to be imported into England, as an article of commerce, and then the red colour extracted from it, by the well known means of removing such colour from such substances. The extract of Safflower now obtained from the cotton, flax, wool, or other material previously charged with it as above described, is to be mixed with the suitable fluids, and employed as a red dye in the same way that dyers usually employ the extract of Safflower, when obtained by the old mode.

[Inrolled, May, 1824.]

To Joseph Gillman, *of Newgate-street, in the City of London, Silk Warehouseman, and* John Hewitson Wilson, *of Manchester, in the County of Lancaster, Silk and Cotton Manufacturer, for their Invention of certain Improvements in the Manufacture of Hats and Bonnets.*

[Sealed 18th November, 1823.]

This patent is granted for a peculiar kind of fabric, to be made of cotton, or a mixture of cotton and silk, for the covering of hats and bonnets in imitation of beaver. The foundation of the hat or bonnet may be of felt, hemp, wool, or any of the usual materials, and which, when formed, is to be covered by the fabric in question. This fabric is to be woven in an ordinary loom, and to consist either wholly of cotton, or to have cotton for its basis, and silk for its outside.

Carded and roved cotton is to be employed in the ordinary way for weft to produce the face side of the fabric when made wholly of cotton; and for the other side, cotton spun into what is called fifty weft, and for the warp cotton twist. These are to be disposed in the loom in the following manner:—

The set of shafts or lambs, consisting of eight at top and eight at bottom, are to be knit by a harness-knitter, in the usual manner. The process is then began on either side of the warp with the first end, which is drawn into either the first front or back heald; the second end of the warp is then drawn into the second heald, and so on until an end is drawn into every shaft; then taking the first shaft again, draw in the ends in succession until the whole warp is disposed of. After this, tie the gears to lambs and jacks in the common way; the first back shaft to the first treadle on the right side with a short cord; and the second, third, &c. to the eighth with long cords to the same treadle. Then to the seventh treadle tie the fifth shaft with a short cord, and the remaining shafts with long cords, and so on until all the shafts and treadles are properly tied. Then draw the warp into the reed, two ends into each dent, until it is all drawn in, and the loom prepared for work. Such is the description of the process to be employed, which we presume will be understood by operative weavers. When the fabric is woven, the pile is to be raised upon its face by means of cards and teazles, and it may be dyed by the common processes. When silk is to form the face of the fabric, the weft must be of prepared silk, instead of carded and roved cotton as above expressed.

[Inrolled, May, 1824.]

To Stephen Wilson, *of Streatham, in the County of Surrey, Esq. for certain Improvements in Machinery for Weaving and Winding.*

(*Continued from page* 5.)

The second part of this invention is an apparatus for winding the silk from the skain on to quills ready for the shuttles. The apparatus is a circular table, carrying a number of reels above charged with silk, and a corresponding number of horizontal spindles below, which draw the silk off on to the quills.

Plate IV. Fig. 1, is a perspective view of this table and its appendages, with the reels and quills as they would appear when ready for operation; *a a a*, three of the reels, upon each of which a skain of silk is placed, and the threads from thence led respectively to the quills *b b b* below. To put this machinery in action, the foot of the operator is to be placed upon the treadle *c*, by the movement of which

a vertical spindle, carrying the toothed wheel *d* and a flyer *e e e*, is made to turn. This wheel *d* takes into another toothed wheel *f*, which is upon the central shaft, with flyers also, and a little above this wheel, upon the same shaft, is a pulley *g*. From this pulley endless cords extend to pullies *h h h*, and thence proceed, as at *i i i*, to friction rollers at *k k k;* these friction rollers consequently revolve with great velocity as long as the central shaft is actuated; *l l l*, are guides, through which the silken threads from the reels *a* are passed to *b b b*, the quills that receive the threads.

These quills are placed upon horizontal spindles, at the ends of which are cones in contact with the friction rollers *k*, above-mentioned; and by these means it will be perceived the revolution of the friction rollers cause the quills to turn rapidly, and to draw off the silken threads from the reels, with very slight tension; but as it is necessary that these threads should be distributed equally from end to end of the quills, a small traversing motion of the table backward and forward is produced by a rod with an endless screw, and some little wheels placed under the table, which are connected with the wheels *m*.

As it frequently happens that one or other of the threads break in their progress from the reels to the quills, the table, with the whole of the apparatus, is enabled to turn upon its centre; so that the operator, in order to mend the broken thread, has only to give a rotatory movement to the table by hand, and the whole will pass round without stopping the winding of any of the other reels or quills, each one having its movement independent of another. The same will also be the case when any of the quills are full, those may be removed, and empty quills placed in their stead, without interrupting the winding of the other parts of the machine.

[Inrolled, November, 1823.]

To THOMAS HORNE, *the younger, of Belmont-Row, Birmingham, in the County of Warwick, Brass Founder, for his Invention of certain Improvements in the Manufacture of Rack Pullies in Brass, or other metals.*

[Sealed 9th December, 1823.]

THIS invention is an improved manner of making racks for the pullies of roller blinds. These pullies are employed to carry a cord which passes over the top roller of the blind, and by means of this cord the blind is drawn up. As however the tension of the cord slackens, it frequently becomes necessary to slide the pulley down lower in its rack, for the purpose of tightening the cord: the rack in question is the subject of the present patent.

These pulley racks are to be formed out of plate brass or other metal, and suitable indentations produced by revolving dies. Ingots of metal are to be passed through rollers, and reduced to about the thickness of one eighth of an inch: after being thus prepared in thin plates, these plates are made to pass through between the revolving dies, the upper die having a smooth periphery, the lower die formed with an indented groove, (*or vice versâ.*) By these means the plate of the rack is produced with the necessary steps, notches, or indentations raised upon its face, while the back of the plate is perfectly level and smooth. The necessary trimming of the plate is to be done by a cutting press, and its edges to be turned up upon a mandrel, by means of suitable tools, or by a mallet in the ordinary way.

It is stated that the indentations of these pulley racks may be produced by a stamping apparatus instead of the revolving dies, but this is not considered to be so convenient or eligible. The subject of the patent is a mode of making these racks with smooth level backs by pressure, not by casting, and therefore both modes are claimed as coming within the view and answering the object of the inventor.

[*Inrolled, June*, 1824.]

To George Minshaw Glascott, *of Great Garden-street, Whitechapel, in the County of Middlesex, Brass-founder, and* Tobias Mitchell, *of UpperThames-street, in the City of London, Gentleman, for their Invention of certain Improvements in the Construction or Form of Nails, to be used in or for the Securing of Copper and other Sheathing on Ships, and for other purposes.*

[Sealed 9th December, 1823.]

The patentees state, that they have observed, when the copper sheathing of ships have been attached to the wood-work by nails with flat heads, swelling on the under side, (that is, such formed nails as are made to fit what is called counter-sunk holes) that the sea water has penetrated between the nails and the copper, and, by depositing marine acid, has produced a very considerable degree of corrosion, to the great injury and insecurity of the sheathing. The subject, therefore, of the present patent is the production of such a formed nail as will prevent this inconvenience; with which view it is proposed to make sheathing nails either perfectly flat on the under side of the head and rounded at the top, or concave on the under side and convex above, by which forms it is presumed that the under side of the nail's head will lie close to the sheathing, and prevent the sea water from insinuating itself between.

[*Inrolled, June*, 1824.]

[It is not very easy to discover what the patentees mean to claim under this patent, the form of the nail proposed having been in use from time immemorial; can they expect to reserve to themselves exclusively its employment in one specific branch of the arts, (even if it had never been there employed before) while it is common to every other branch, and has been so for centuries?]—Ed.

To George Pollard, *late of Rupert Street, in the Parish of St. James, in the County of Middlesex, but now of Gloucester Place, Kentish Town, in the same County, Brass Founder; for his Invention of certain Improvements on Machines or Machinery, for levigating or grinding Colours used in the various Branches of Painting, which Machinery may be worked by any suitable Power, and is applicable to other useful Purposes.*

[Sealed 19th January, 1824.]

The subjects of this patent are, first, an apparatus for breaking down ores, hard drugs, minerals, and other substances, into small particles, or powder; and secondly, an apparatus, by which certain of these particles may be ground either in a dry state or with fluids, for the purpose of preparing paint and printing-ink, and a variety of other things requiring such operation.

Plate IV. Fig. 2, shews a geometrical view of the breaking apparatus mounted upon a strong wooden frame. It consists of a pair of rollers, the one indented, the other plain; these are made to revolve upon a solid bed, on which the materials intended to be broken are placed. A central shaft, *a*, actuated by the bevel gear *b*, connected with any first mover, carries round the indented roller *c* and the plain roller *d*, the former of which break and reduce the substances into small pieces, the latter crush it into powder. The periphery of the roller *c* is cut into regular indentations, the angles of which are equal to each other, and in passing several times over the material, the points operate upon it so completely as to break down every

lump, and enables the plain roller *d* which follows, to pulverize the whole with the greatest facility. The edges of the bed being made shelving, the material will naturally fall towards the centre, and thereby keep under the operation of the rollers. The material seldom attaches itself to the indented roller, but as it is sometimes apt to adhere to the plain roller, it will be necessary to attach a scraper behind it.

When the material has been operated upon a sufficient time to pulverize the whole, it is made to pass down the shoot *e* into the box *f*, where it is to be sifted. This sifting apparatus, suspended by iron rods, is agitated by means of an arm connected to a crank *g*, which being moved by small bevel gear from the central wheels *b*, gives to the box a rapid lateral motion, and causes the finer particles of powder to pass into the lower partition, from whence it is taken to the mullers of the second apparatus about to be described. But as many other substances beside colours, which it is in the contemplation of the patentee to break by this apparatus, may not require to be ground to an impalpable powder: as for instance, drugs, and hard wood for chemists, dyers, &c.—it may not be unnecessary, under all circumstances, to employ the sifting apparatus.

As a machine of this kind may be desirable in many manufactories, for the breaking down of hard substances, as in the reduction of coal for gas-work, or the breaking oil cake for feeding cattle, &c. the patentee proposes to combine two of his indented rollers, the surfaces acting against each other; the indentations of which must, in that case, be formed by planes, all at right angles. These rollers may be placed in pairs in suitable frames, with adjustments as to distance, and the materials to be broken may be let fall from a hopper immediately above; when, by passing through between the ndentations, the substances will become completely broken to any required fineness.

These machines may be made of any size; that represented in the figure is to be considered as about two feet wide and four feet high; they may be rendered portable, and supersede the use of the pestle and mortar, and thereby obviate very unpleasant, and sometimes fatal consequences, to the operating workman. The construction is so simple, that it will rarely get out of order; or if it should, can be repaired with ease. In extensive factories, many of these machines, upon a larger scale, may be combined and put in motion by a steam engine, water wheel, horse power, or otherwise, as convenience may dictate.

The second apparatus for mixing and preparing paint and other substances either in a dry or fluid state, is shown at fig. 3. The machinery is placed upon strong wooden framework, and receives its movements from a shaft *a*, to which a fly-wheel is attached. This may be actuated by hand, or by any other power. *b b* are two horizontal shafts, turned by bevel gear at *a*, and which, by means of bevel wheels at their ends, turn the vertical shafts *c c*. At the top of these shafts are cranks *d d*, connected to a sliding rod *ee*, which carries the frame *f* of the mullers *gg*, and causes them to traverse round upon the bed *h*; or a circular runner stone *i* may be employed instead of the mullers, which is to traverse upon the bed *h*, by its attachment at *f*, to the sliding rod *e*, in a similar way to that of the mullers. When the colour is to be removed from the bed, the stones, with their carriages, may be raised and suspended by a hook *j* upon the sliding bar.

In order to make these stones turn on their own centres while traversing upon the beds, small shafts *k k* are attached with bevel gear, which gives a rotatory motion to the central shafts of the frames *f f*, and by that means cause each stone to perform an epicycloidal course as it traverses, which is extremely desirable, in order to grind the colours perfectly.

This apparatus, which is not more than three or four feet long, may be worked by a very small power, as its resistance will be trifling; it is proposed that a boy shall be employed to turn it by a winch, applied to the shaft *a*. The number of stones, however, may be increased, when required to effect an extensive business, and then it will be necessary to attach it to a greater power.

For grinding the finer water colours, it may be desirable to use a glass bed, and glass mullers or runners, as the porrosity of stone frequently causes an absorption of the colour, and prevents that perfect grinding which is necessary for the purposes of the artist. This machine will also be found desirable in the grinding of lithographic stones to a surface perfectly flat, and in the preparation of the ink used for lithographic purposes, and also in preparing ink used in the common operations of printing, and many other such operations, some of which being in the ordinary way detrimental to the health of the workmen, by emitting noxious effluvia, may, by these means, be performed without any of those unpleasant consequences.

It is obvious that such an apparatus as the above must be extremely desirable in preparing many of those chemical substances which in pulverising by the ordinary means throw off poisonous particles very much to the injury of the health of the workman, and the expedition by which colours may be ground in this apparatus cannot fail to recommend its extensive adoption.

[*Inrolled, June*, 1824.]

To SIMEON BROADMEADOW, *of the Town of Abergavenny, in the County of Monmouth, Civil Engineer, for his Invention of a New and Improved Method of Manufacturing and Purifying Inflammable Gases by the Admission and Admixture of Atmospheric Air.*

[Sealed, 19th January, 1824.]

THE patentee states that his invention, as regards the manufacture of inflammable gases, consists in exhausting or drawing the gas either directly or indirectly from the retort, oven, or other place, where the gas is generated, by means of an air-exhausting apparatus, which may either be in the form that is usually called a pair of bellows, or in the form of what is usually called an air-pump, or any other convenient form of air exhauster, to be placed between the retort, oven, or other gas generator and the gasometer; the effect of which is to draw the gas from the retort or other generator without the waste usually incurred by the escape of gas when the mouth-piece or lid of the retorts now in use is pulled off. And his invention, as regards the purifying of inflammable gases, consists in the introduction of a certain portion of atmospheric air into the gasometer by means of the said exhausting apparatus, when the gasometer shall have been partly filled with gas.

In plate IV. Fig. 4, is a representation of the apparatus proposed to be employed, which consists of two ovens *a a*, in which the gas is to be generated; *b b* are the gas-pipes leading up to two small cisterns; *c c*, which are said to be intended to supersede the hydraulic main (whether these are to be filled with water is not stated). The pipes *b b* are made to slope, for the purpose of conducting back into the oven so much of the tar as may be condensed in its passage up to the cisterns; *d d* are the pipes for conveying the gas away to the condensor *e*, from whence it rises into the exhauster *f* through a pipe *g*, situate at the part where the air-valve is placed in ordinary bellows; *h* is a small steam engine to work the exhauster, which is proposed to be done by a wheel *i*. By these means, the bellows, or other exhausting apparatus, is intended to transfer the gas from the condensor to the gasometer through the pipe *k*.

The ovens being charged with coal, and that in a state of combustion, the plugs, which close small air vents, are to be removed from the oven doors; and as soon as a sufficient quantity of gas has arisen within, to force its escape through these apertures, the exhauster must be put in action, the effect of which will be, that the gas generated in the ovens will be drawn into the condensor with much greater rapidity than it would flow by its own expansive force.

When all the gas has been drawn from the oven, and forced into the gasometer, the fires should be extinguished, the doors of the oven thrown open, and the exhauster continued working until it has drawn in a portion of atmospheric air equal in bulk to about one-eighth the volume of the gas, with which it will mix and purify the gas so as to render it more desirable for the purposes of illumination than gas purified in the ordinary way.

This mode of purifying gas by exhausting the vessels in which it is generated, admits of employing ovens and retorts of a much slighter make, and precludes the necessity of rendering them air-tight, or hermetically sealing their mouths as heretofore. These ovens or retorts, however, are not to be considered as the invention of the patentee, his claim being founded in the employment of the exhausting apparatus as above described, and in mixing common or atmospheric air with the gas in the gasometer, for the purpose of purifying it.

[*Inrolled, May,* 1824.]

Original Communications.

ON THE CIVIL AND SOLAR YEAR.

By JOSEPH LUCKCOCK, Esq. *Edgebaston, near Birmingham.*

To the Editor of the London Journal of Arts, &c.

SIR,

DR. CHARLES HUTTON says, in his Mathematical Dictionary. "Year, or SOLAR YEAR, properly, and by way of eminence so called, is the space of time in which the sun moves through the twelve signs of the Ecliptic. This, by the observations of the best modern astronomers, contains 365 days, 5 hours, 48 minutes, 48 seconds: the quantity assumed by the authors of the Gregorian calendar is 365 days, 5 hours, 49 minutes.

"But in the civil or popular account, this Year only contains 365 days, except every fourth year, which contains 366.

"JULIAN YEAR. This is in effect a Solar year, commonly containing 365 days; though every fourth year, called Bissextile, it contains 366.

"The mean quantity therefore of the Julian year, is 365¼ days, or 365 days, 6 hours, exceeding the true Solar year by somewhat more than 11 minutes; an excess which amounts to a whole day in almost 131 years. Hence the times of the equinoxes go backwards, and fall earlier, by one day, in about 130 or 131 years. And thus the Roman Year stood, till it was farther corrected by Pope Gregory.

"GREGORIAN YEAR. This is the Julian year, corrected by this rule viz., that instead of every secular or 100th year being a bissextile, as it would be in the former way, in the new way three of them are common years, and only the fourth is bissextile; the omission of three intercalary days in 400 years would make the civil year keep pace nearly with the solar year for the time to come.

"Yet this last correction is still not quite perfect; for as it has been shewn that in four centuries the Julian year gains 3 days, 2 hours, 40 minutes; and as it is only three days that are kept out in the Gregorian year; there is still an excess of 2 hours, 40 minutes, in four centuries, which amounts to a whole day in 36 centuries, or in 3600 years.

"Though the Gregorian calendar be more accurate than the Julian, yet it is not without imperfections, as Scaliger and Calvisius have fully shewn; *nor is it perhaps possible to devise any one that shall be quite perfect.*"

This desideratum, that "perhaps impossible point," is the object we are in pursuit of, and which it is hoped to attain.

When a pair of toothed wheels of unequal diameter work into each other, and two of the teeth which happen to be in contact are marked, it is easy to calculate the number of revolutions when the marked teeth will return to the same position.

The civil year consists of 365 days, the solar year consists of 365 days, 5 hours, 48 minutes, 48 seconds; 5 hours, 48 minutes, 48 seconds, are equal to 20928 seconds; and 20928 seconds are equal to the fraction, (when reduced to its lowest denomination) $\frac{109}{450}$ of a day, therefore the solar year is 365 $\frac{109}{450}$ days.

Now suppose the civil and the solar years to be two immense wheels, whose diameters are to each other as 365 is to 365 $\frac{109}{450}$, and two points in their peripheries brought in contact; the enquiry is, how many revolutions will it be necessary for the largest wheel to make before the same points will come in contact a second time? And here it is evident, from the terms of the question, that the very circumstance of reducing the fraction to its lowest denomination, has afforded us the only number that will fulfil the conditions, namely, the denominator of the fraction 450; and that the numerator 109 is the number of days to be added to 450 civil years, in order to make them exactly coincide with 450 solar years.

The solar year consists of 365 days, 5 hours, 48 minutes, 38 seconds, and the fractional quantity, 5 hours, 48 minutes, 48 seconds, is what we are to get rid of.

	d.	h.	m.	sec.	yrs.
	0	5	48	48	
If we multiply by 5 we get rid of the seconds				5	5
	1	5	4	0	
If this product is multiplied by 15; the minutes will vanish.				15	15
	18	4	0	0	75
				6	6
	109	0	0	0	450
				2	2
	218	0	0	0	900

If we multiply the second product by 6, the hours are removed, and the end is accomplished. The 5, 15, and 6, being continually multiplied, produce 450; and there are 109 intercalary days in 450 years, without a remainder; but as 450 is not divisible by 4, for the bissextile or leap years it is necessary to multiply both sums by 2, we then have 218 intercalary days belonging to 900 years without a remainder.

Divide 900 by 4, the quotient 225 is the number of leap years of the Julian calendar, which ought to be only 218; deduct 218 from 225, and the remainder 7 are the number of intercalary days too many, and which it is our object to dispose of.

Then, according to the Gregorian Year, if three intercalary days are omitted the first four centuries, three other omitted the next four centuries, and, instead of going on for four centuries more, if a day is omitted the ninth century, then will the civil perfectly coincide with the solar year, in a cycle of 900 years. This period has been stated, and now fully believed by the mathematical world to be 3600 years—this error is extremely obvious, I therefore forbear giving the demonstration.

It is evident that the lesser period, or 450 years, may be taken instead of 900, but this would occasion a complete change in the quartenary or Julian period, which must give way to the quintuple division of time.

There are 109 intercalary days in 450 years; if every fifth year were a bissextile, this would take 90 days out of the 109, leaving a remainder of 19; if 18 of these were taken at regular intervals of 25 years, being every fifth leap year, or quarter of a century; every year on which this would fall, the intercalary day would be doubled, and February would contain 30 days; the remaining one would be taken the last year, making three intercalary days, February then containing 31 days, and would complete the cycle of 450 years.

There are other means of discovering the cycle, or period of 450 years, than those already pointed out.

If we add continually to itself, the sum 5 hours, 48 minutes, 48 seconds, in five years, the amount will be 1 day, 5 hours, 4 minutes, always deducting the *day* for a leap year, and proceeding with the additions, in four years more, the sum is 1 day, 4 hours, 19 minutes, 12 seconds; in another four years, the sum is 1 day, 3 hours, 34 minutes, 24 seconds, &c., and at the end of the 450th addition, the cycle is complete, and there is no remainder, viz., the several additions end in one day, and the number of days will be found to be 109.

But in this division of time, although it is more correct in the detail, there is such a mixture of fives and fours, the leap years falling on all the odd numbers, and again on all the even numbers, that there can be no rule devised by which we can know a leap year from a common one, except by having a table of leap years before us, formed by continued additions.

Therefore the preference is to be given to the quintuple division, whose leap years are known by simple inspection.

Supposing this period substituted for the Julian, the year 1800 would be greatly to be preferred, first, because the cycle would commence with the century, and because 1800 years happens to contain four cycles, and therefore this correction of the calendar would naturally flow with the Christian era.

It may be proper to mention, that the conclusion we are to draw is this, that 450 solar years, are equal to 450 years, 109 days of the civil or common year, each period containing 164,359 days.

All the years ending with 1, 2, 3, 4, 6, 7, 8, 9, are common years, for ever.

All the years ending with 5 or 0, are leap years, for ever.

All the years ending with 25, 50, 75, 00, are double leap years for ever.

Every 450th year will end with 00 or 50, and will be divisible by 9, leaving no remainder.

Table of 109 Leap Years, in a Cycle of 450 Years commencing with the Year 1800.

1805	1880	1955	2030	2105	2180
10	85	60	35	10	85
15	90	65	40	15	90
20	95	70	45	20	95
25*	1900*	75*	50*	25*	2200*
30	5	80	55	30	5
35	10	85	60	35	10
40	15	90	65	40	15
45	20	95	70	45	20
50*	25*	2000*	75*	50*	25*
55	30	5	80	55	30
60	35	10	85	60	35
65	40	15	90	65	40
70	45	20	95	70	45
75*	50*	25*	2100	57*	2250*

All these are Leap Years. In the plain numbers, or those without an asterisk, *February has 29 days.*

All those marked with an asterisk are double leap years, *February has 30 days.*

The last year has two asterisks, and *February has 31 days*, making 109 intercalary days in the whole, and completing the cycle of 450 years. The civil and the solar year ending at the same instant.

The first period of 900 years is calculated to correct the Julian and Gregorian calendar, and which correction is absolutely necessary; but the second period of 450 years is a far more elegant division of time, has the advantage of greater simplicity, would more readily meet the comprehension of the world at large, and might with great propriety be substituted for both.

To the Editor of the London Journal, &c.

SIR,

A CERTAIN Hotspur who, though making free with *my name*, conceals his own, has attacked my labours and character, in terms which the simple love of truth could not have inspired! *That* love supposes a patient examination of the subjects treated of: and to such attention W. D. appears a stranger. To avoid the fatigue of *thought*, he consults an awkward *experiment*, which by the by, *confirms* my statements, and *destroys* his own! If, Sir, the readers of your Number for July please to look at W. D.'s Letter (page 25, No. XLIII.), they will see how lavish he is of reproof, how sparing of knowledge, and how careless of truth! He seems, indeed, to have equipped his *Pegasus*, as Hudibras did his bony steed—so as to be goaded on one flank only—

"As wisely knowing, could he stir
To active trot, one side of 's horse,
The other would not,——Travel worse."

In truth, W. D has made a foul blow at my talent and probity, on the flimsy foundation of his own. He has chosen a part of my work intended to elucidate a *principle*, and conjured it into a lamp! For *I* had taken care to inform my readers, that the fifth figure was *only* intended to explain how the oil in the higher tube, is supported by the united weights of the shorter columns below. (See plate 95, figure 5, of my Century of Inventions.) I therefore merely said, in that place, "the oil will *abide* in the high tube, at A, as long as the mouth *g* is kept full, or nearly so." Indeed W. D. quotes these words, (but with a false emphasis,) in page 27, and his experiment proves their *truth*, almost as much as though it had been made by an impartial man. But if this had been the case his syphon would have been applied, *not* at A but at *g*, and *some* of the oil have been drawn off *there!* when the oil in the longer tube, would *not* have remained at A, but have sunk to some lower level; *where the burner of a lamp might have been placed.* And if, afterwards, the oil previously taken away had been restored to the cup *g*, the surface at A would have again risen to its *present* level, *so as for a time to supply a burner.*

But in following W. D., I fall into trivialities. This tube *is not the lamp I described,* and if any of my readers find not a principle of elevation for the oil, I am content to pass for the dolt W. D. has attempted to make me! I will "throw my descriptions behind the fire;" I will give up my "said-to-be-lamp;" I will abandon my "anomalous projects," and my "self-evident absurdities," to W. D.'s vapid censure, and submit to rank even below him in the scale of candour and science.

The lamp itself is given in fig. 6 of my 35th plate, which W. D. *might* have seen, at an inch distance from that fig. 5, he has so indiscreetly handled. Could it be that W. D. is afflicted with natural cecity? or was he wilfully blind to this figure, that he might have something to cavil at? However that be, my description says, "this lamp is seen to consist of a series of *air tight cups* embracing each other, one half with their mouths opening upwards, and the other half with their's opening downwards. (See pp. 278-9.) These inverted cups make one body with the moveable cover shewn between *d* and *e*; to which is soldered the tube *h i*, which sliding in the case *f g*, keeps this inverted vessel steady. We finally take notice of the weight placed under *f g*, upon the said inverted vessel, *and which helps to counterpoise the oil in the rising tube*, &c."

Now, Sir, I ask any child of reason, whether this *moving* cover and its *weight f g*, do not actively press on the oil in the cups, and tend to urge it upward, and to raise *new* oil from the central cup below, to supply the consumption above? If I thought W. D. not incurable, I would recommend his trying another experiment to prove the fact; but more complete than the one he has made the ground of his present satire. Especially I would advise him not to strew so thick about him his broken darts, and to pause before he wounds the feelings of older, and mayhap wiser men than himself; and in general, I would counsel him (as they say the late king of Prussia did *a too aspiring cadet*) to "tarry at Jericho till his beard was grown."

To conclude, Sir, I trust my labours are already placed beyond the reach of such unfledged criticism as this: and I expect you will give to my defence the same publicity as you did to W. D.'s unfeeling and unprovoked attack. This only will satisfy the lovers of truth, and secure the ends of justice."—I am, Sir,

Your obedient Servant,

JAMES WHITE, Civil Engineer.

Manchester, July 20th, 1824.

American Patent Laws.

Our notice (at p. 35, of the present volume,) of some alterations in the Patent Laws of the United States, have called forth many enquiries among our readers, as to the fact of those alterations having actually taken place; we can only say, that the information was given as we received it from Washington, and we are unable to satisfy the doubts of our enquirers, until we obtain answers to our letters from America, which will necessarily occupy several months.

It is certain that a patent has been obtained in the United States, by an Englishman, Mr. Brown, for the invention of a certain improved Engine, (the same described in our present number,) he never having resided in that country; but whether an Act of Congress, passed expressly for this individual case, may have given rise to the supposition that the general laws of patents have actually been revised and altered, we cannot at present determine. The American Consul has not yet received official intimation of the change, though he is not prepared to deny it, as such a project has been for some time past in agitation, and without doubt will shortly (if not already enacted) be carried into effect in that country.

Novel Inventions.

Bleaching Flax and Hemp.

After the flax or hemp has been broken from the boon, and otherwise cleansed from its woody particles, it is to be tied in bundles, by a cord passing round its middle; if the staple is very long it may be tied in bundles of about one pound, but in general a smaller quantity will suit better. These bundles are to be immersed in a solution of slaked lime, of the consistence of whitewash, for about six hours, after which they are to be washed in clean water, so as to discharge all the lime from the fibres; it is then to be boiled in water, with about four ounces of pot or pearl-ash to every pound of flax, for nearly six hours, supplying fresh water as the quantity becomes reduced by evaporation.

During the time of its boiling, the flax must be taken in and out of the alkaline solution, for the purpose of disturbing its colouring matter, and when sufficiently boiled, it will feel slippery between the fingers; after which it is to be washed in clean water, and again subjected to a solution of lime as before, repeatedly agitating it so as to admit of the menstruum acting uniformly upon the fibre; it may then be allowed to remain in this solution, in a quiescent state, for about six hours, and then, after washing it in clean water, the extraneous matter will be completely removed, and the fibre left in a pure state, but slightly tinged with yellow.

To remove this yellow tinge, the flax must be immersed in a very weak solution of acid in water, the acid being but just perceptible to the taste. Sulphuric acid, or oil of vitriol, is to be preferred, on account of its cheapness. When the flax has been about three hours in this solution, it must be withdrawn and washed, and after drying, it will be found to be of a pure white, and only require to be passed through the hackle to be ready for use.

The fibres of the flax, in its natural state, are held together by an unctuous matter, which resists the action of simple water, but by the operation of the alkalis upon it, this matter forms a gelatinous mass, and that, when acted upon by slaked lime, falls down as a precipitate, and thus sets the fibres free.

Distilling Spirits of Turpentine.

Mr. Frederick Cozzens, of New York, has lately made some discoveries and improvements in preparing or extracting the spirit or oil of turpentine, which the fur or pine tree affords. He states, that by the ordinary method of operation, a heat is required equal to five or six hundred degrees of Fahrenheit to raise the spirits or oil to the head of the still, and to force it down the worm; hence most of the oil of turpentine met with in commerce is partially burnt, and paints mixed with it are in some degree prevented from drying. Mr. C. effects the distillation at the temperature of three hundred or thereabouts, and even, under some circumstances, as low as two hundred and twelve, the boiling point of water. His mode of operating is by placing a vessel of water, capable of holding thirty gallons, immediately over the head of the still, the water is permitted to descend from this vessel through a small tube into a funnel, which conveys it in a stream through the head of the still, and thence down on to the heated turpentine; or a stream may be introduced into any other part of the still,—the principle of the invention being the introduction of a stream of water into the still during the process of distillation.

This stream of water being immediately converted into steam by the elevated temperature of the turpentine is forced through the nozzle into the worm, carrying with it the dense vapour of the turpentine, which being heavy, could not ascend without a superior degree of heat.

The stream of water is continued from the reservoir above in such quantities as may be equal to that carried off by the distilling process. The effect of this operation is perfectly safe, expeditious, and economical; the spirit or oil rises in larger quantities, of a superior quality, and at a lower temperature than by the old mode, and the watery vapour condenses without injuring the oil of turpentine. The resin found in the bottom of the still is more pure, clear, and less likely to be carbonized than heretofore, and the time saved in the operation exceeds one half that expended in the old mode.

Paper Making.

A discovery has been made in France of a material capable of superseding the use of rags in paper making; it is a composition that resembles a preparation of the finest quality of rags, and is readily converted into a pulp without the employment of any kind of machinery, and by which the best kinds of paper are made. This material can be provided at so cheap a rate that it is estimated its whole cost, including preparation, will be less than sixpence per pound. The French paper makers are, we understand, treating with the discoverer for supplies of this material, and we expect the secret will soon be purchased by some of the manufacturers here. The patent laws of France prevent the original patentee from taking his invention or discovery out of that kingdom under the penalty of imprisonment and forfeiture of patent right, but there is no prohibition against his communicating the invention to a foreigner.

Polytechnic and Scientific Intelligence.

Royal Society.

May 27.—The conclusion of Mr. Abraham's paper on magnetism was read, and a paper, by W. H. Woollaston, M.D. V.P.R.S. "On the direction of the eyes in portrait painting."

June 3rd.—A paper was read "On the generation of fishes," by J. L. Prevost, M.D.; and in consequence of the ensuing holidays, the Society adjourned to the 17th of June.

June 17.—The following communications were read, some of which were abridged.

"On the organs of generation of the Axoloti and of other Protei," by Sir E. Home, Bart. V.P.R.S.

"On the effects of temperature on magnetism, and on the diurnal variation of the needle," by S. H. Christie, Esq. M.A. communicated by Sir H. Davy.

"On the preservation of the copper sheathing of ships, and on some chemical facts connected with it," by the President.

"On the application of Doebereiner's new discovery to the purposes of Eudiometry," by W. Henry, M.D. F.R.S.

The Society then adjourned over the long vacation, to meet again on Thursday the 18th of November next.

Astronomical Society of London.

(Continued from Vol. VII. Page 318.)

June 11th. The following papers were read:—

1st. On the variation of the mean motion of the comet of Encke, produced by the resistance of an ether, by M. Massotti. This comet is well known to evince a diminution of its periodic time at each revolution, and the object of the present paper was to demonstrate the cause of this effect. Encke himself supposed it was occasioned by an ether diffused through space, but if so, how happens it that the planets also have not been retarded? This the author attempted to show might be the case, although the phenomenon might pass unobserved. He adopts, with Encke, the hypothesis of Newton, that the density of this ether diminishes in the inverse ratio of the square of the distance from the sun, consequently the planet Mercury would be most likely to be affected by it; and by a long series of analytical investigation, assisted by Legendre's tables of elleptic functions, arrives at the result, that this resistance would not produce a greater change in the mean geocentric longitude of Mercury, than 31′. 2. in the course of a century. Hence, he concludes, that the comet may have met such a resistance from an ether, as will be sufficient to account for the difference between the calculus and the observations, and yet that the planets shall not hitherto have manifested the least effect of such a medium.

2d. On a new astronomical instrument called *the Differential Sextant*, by Benjamin Gompertz, Esq. F.R.S.. This paper was a further and more particular description of the construction and application of the instrument before invented by Mr. Gompertz, and partially described in his paper on astronomical instruments, read before the Society on the 11th of January, 1822. In this instrument, the index reflector is susceptible of motion on one end of the index as on a centre, being the same as that on which the index itself turns, so that the reflector may be set to make any angle at pleasure with the index; the whole being permitted to move, as a bent lever about the centre. The horizon glass also is capable of being adjusted and fixed at different angles to the fixed arm. The object proposed by Mr. Gompertz in this contrivance is, to measure the *difference* of angular distances in any two celestial phenomena, occasioned by those varying circumstances which produce small changes, such as refraction, parallax, aberration, &c. and the paper concluded with some appropriate hints as to the best manner of employing the instrument to these purposes.

3d. An account of an occultation of the *Georgium Sidus* by the moon, which will take place on the 6th of August next, by Francis Baily, Esq. F.R.S. and Vice-President of the Astronomical Society. Mr. Baily begged to call the attention of the Society to this interesting phenomenon, which has never yet been seen, as no occultation has occurred since the discovery of the planet. The occultation will occur within a very few minutes after the moon has passed the meridian, insomuch that those persons possessing a transit instrument will see the planet in the field of view, when the moon's centre is on the meridian. This notice was accompanied by a diagram, showing, that the planet would enter the western or dark limb of the moon at about half way between the moon's centre, and the upper or northern part of her disc. There will be sufficient time to observe the occultation of the planet after the transit of the moon. This interesting phenomenon will, no doubt, attract the notice of every practical astronomer.

This being the last meeting of the Society's present session, an adjournment took place until the 12th of November next.

Rewards bestowed by the Society of Arts.

(Continued from Page 43.)

To Mr. W. Gill, 16, Wilmot-street, Brunswick-square, for a composition in still-life, the silver-palette.

To Mr. H. C. Slous, 6, Bayham-street, Camden Town, for an historical composition, the large gold medal.

Copies in Oil.—To Mr. G. Hilditch, 13, Ludgate-hill, for an historical subject, the silver Isis medal.

To Miss A. Robertson, Tweedmouth, Berwick, for an historical subject, the large silver medal.

To Mr. J. W. Solomon, 86, Piccadilly, for an historical subject, the large silver medal.

To Mr. J. Sargeant, 4, Burlington-place, Kent-road, for an historical subject, the silver palette.

To Mr. J. Eggbrecht, 16, Frith-street, Soho, for a portrait, the silver Isis medal.

Original Paintings in Water Colours.—To Miss M Smith, 16, Bucklersbury, for a miniature portrait, the silver Isis medal.

To Miss Eliz. Twining, 34, Norfolk-street, Strand, for a composition of flowers, the large silver medal.

To Miss Fr. Strickland, Henley Park, for a composition of flowers, the gold Isis medal.

To Miss A. L. Napier, Woolwich Common, for a composition of fruit, the silver palette.

To Miss M. J. Hull, Beverley, for a composition of flowers, the silver palette.

Copies in Water Colours.—To Miss Twining, 34, Norfolk-street, strand, for an historical subject, the silver Isis medal.

To the same, for a portrait, a miniature, the large silver medal.

To Mrs. Matheson, 75, Margaret-street, Cavendish-square, for an historical subject, the silver palette.

To Miss E. Twining, 34, Norfolk-street, Strand, for a portrait, a miniature, the silver palette.

To Miss S. Cox, 22, Nottingham-street, for a portrait, a miniature, the silver palette.

To Miss J. S. Guy, 3, Bartlett's-place, for a landscape, the silver palette.

To Miss A. Hopkins, 83, Berwick-street, Soho, for a landscape, the large silver medal.

To Mr. Edwin Williams, 12, St. Alban's-place, for a landscape, the silver palette.

To Miss L. J. Green, 27, Argyll-street, for a miniature composition, the silver palette.

Original Drawings in Chalk, Pencil, and Indian Ink.—To Mr. E. Williams, Ambroseden, for a drawing from the living figure, the silver palette.

Copies in Chalk, Pencil, and Indian Ink.—To Mr. T. Barrett, 78, Mark-lane, for a landscape, the silver Isis medal.

To Miss E. Bartrum, 11, Upper Bedford-place, for a head in chalk, the silver palette.

To Miss Stacey, 8, Hart-street, Bloomsbury, for a head in chalk, the silver palette.

To Miss M. J. Lightfoot, 10, Ebury-street, Pimlico, for a head in chalk, the silver palette.

To Mr. M. Starling, 19, Weston-place, Pancras-road, for a landscape in pen and ink, the silver Isis medal.

To Miss S. H. Oakes, Mitcham, Surrey, for a head in chalk, the silver Isis medal.

To Miss H. M. Lightfoot, 10, Ebury-street, Pimlico, for a head in chalk, the silver palette.

To Miss E. Guy, 3, Bartlett's-place, Holborn, for an historical subject in chalk, the silver Isis medal.

To the same, for a landscape in pencil, the silver Isis medal.

To Miss Mumford, Thames Ditton, for an historical subject in chalk, the silver palette.

To Miss M. Hartman, 48, York-street, Portman-square, for an historical subject, the large silver medal.

To Miss J. Robson, Doncaster, for a landscape in pen and ink, the silver palette

To Miss C. F. Gray, 18, Burton-street, Burton Crescent, for a landscape in pencil, the Silver Palette.

To D. Pasmore, 6, Salisbury-court, Fleet-street, for an historical subject in pencil, the silver palette.

To the same, for a head in chalk, the silver palette.—*This youth is a charity boy, in St. Bride's School.*

To Mr. G. Brown, 198, Regent-street, for an historical subject in Indian ink, the silver Isis medal.

To Miss Leonora Burbank, Albany Road, Camberwell, for a head in chalk, the silver Isis medal.

Drawings from Statues and Busts.—To Miss S. Cox, 22, Nottingham-street, for a drawing in chalk from a bust, the large silver medal.

To Miss Augusta Hamlyn, Plymouth, for a drawing in chalk from a bust, the silver palette.

To Miss D. Laurance, 360, Oxford-street, for a drawing in chalk from a bust, the silver Isis medal.

To Mr. H. T. Wright, 52, Great Titchfield-street, for a drawing in outline from the antique, the silver palette.

To Mr. S. M. Smith, 49, Great Marlborough-street, for a finished Drawing from the antique, the silver Isis medal.

To Mr Edwin Dalton, 7, Aldgate, for a finished drawing from the antique, the silver palette.

To Mr. J. W. Solomon, 86, Piccadilly, for a finished drawing from the antique, the large silver medal.

To Mr. J. F. Denman, 32, Cannon-street Road, for a drawing in chalk, from a bust, the silver Isis medal.

To Mr. B. R. Green, 27, Argyll-street, for a drawing in chalk from a bust, the silver palette.

To. Mr. W. Gill, 16, Wilmot-street, Brunswick-square, for a drawingin chalk from the antique, the silver palette.

Models in Plaster.—To Mr. Joseph Deare, 12, Great St. Helen's, Bishopsgate, for a bas-relief from the life, the silver Isis medal.

To Mr. Ed. Edwards, 4, Newcastle-place, Clerkenwell, for a bas-relief from the life, the large silver medal.

To the same, for a bust from the life, the silver Isis medal.

To Mr. E. G. Physick, 23, Spring-street, Montague-square, for a model of a group, the large silver medal.

To Mr. T. Butler, 91, Dean-street, for a model of a figure from the antique, the large silver medal.

To Mr. Frederic Tatham, 1, Queen-street, May-fair, for a model of a figure from the antique, the silver palette.

To Mr. Joseph Deare, 12, Great St. Helen's, Bishopsgate, for a model of a group from the antique, the silver Isis medal.

To Mr. J. Sargeant, 4, Burlington-place, Kent-road, for a model of a bust, the large silver medal.

Architecture.—To Mr. R. G. Wetten, 19, Bruton-street, for a design for London Bridge, the gold medallion.

To Mr. Henry Roberts, Camberwell-terrace, for a design for London Bridge, the large silver medal.

To Mr. J. D. Paine, 39, High-street, Bloomsbury, for a design for London Bridge, the large silver medal.

To Mr. G. Parminter, Jun., 19, High-street, Blackfriars, for a perspective view of St. Paul's, Shadwell, the large silver medal.

To Mr. J. B. Watson, Surbiton-hill, Kingston, for an original design for houses, in Greek architecture, the gold Isis medal.

To Mr. G. T. Andrews, 29, Lower Brook-street, for an original design for houses, in Greek architecture, the silver Isis medal.

To Mr. T. Plowman, Oxford, for an original design for houses, in Greek architecture, the large silver medal.

To Mr. P. H. Desvignes, 15, Hunter-street, Brunswick-square, for a perspective view of Pancras New Church, the silver Isis medal.

To Mr. J. G. Welford, Jun., 27, South-street, Grosvenor-square, for a perspective view of a Corinthian capital, the silver palette.

To Mr. W. Morris, 26, St. Paul's Church-yard, for a perspective view of a Corinthian column, the silver Isis medal.

To Mr. Henry Roberts, Camberwell-terrace, for a perspective drawing of a Corinthian capital, the large silver medal.

Drawings of Machines.—To Mr. J. B. Watson, Surbiton-hill, Kingston, for a perspective drawing of a crane, the silver Isis medal.

To Mr. P. W. Barlow, Woolwich, for a perspective view of a transit theodolite, the large silver medal.

Engravings.—To Mr. G. Presbury, 12, Denzell-street, for a finished historical engraving, the large silver medal.

To Mr. Ed. Radclyffe, Birmingham, for an etching of animals, the silver Isis medal.

To Mr. S. Clint, Rolls-buildings, for an original medal die of a head, the large silver medal.

To Mr. James Howe, Little Tufton-street, for an original whole-length miniature in wax, the silver Isis medal.

To Mr. Edm. Turrell, 46, Clarendon-street, for an improved menstruum for biting in on steel plate, the large gold medal.

To Mr. J. Straker, Jun., 11, Redcross-square, Cripplegate, for a new mode of embossing on wood, the silver Isis medal and ten guineas.

In Manufactures.—To D. Maclean, Esq. 7, Basinghall-street, for cloth made of New South Wales wool, the gold Isis medal.

Rewards given for Bonnets made of British Grass in imitation of Leghorn.—To Miss L. Hollowell, Neithrope, Banbury, fifteen guineas.

To Mrs. Morrice, Great Brickhill, Bucks, fifteen guineas.

To Priscilla Surrey, Harpingden, Herts, fifteen guineas.

To Betty Webber, Clatworthy, Devon, ten guineas.

To Mrs. E. Mills, Northumberland-place, Bath, ten guineas.

To Mary Marshall, Bandon, Cork, the silver Ceres medal.

To the children of the school at Bandon, five guineas.

To Messrs. Jas. and A. Muir, Greenock, the silver Ceres medal.

To Mrs. Mears, Durley, Hants, the silver Ceres medal.

To Mrs. Venn, Hadleigh, Suffolk, the silver Ceres medal.

To Mrs. S. Pyman, Coombs, Stowmarket, the silver Ceres medal.

To Messrs. Cobbing and Co., Bury St. Edmunds, the silver Ceres medal.

To Mrs. E. Bloomfield, Bury St. Edmunds, five guineas.

To Mrs. M'Michael, Penrith, five guineas.

To Jane Hurst, Leckhampstead, two guineas.

To the children of the National School at Nunney, near Frome, two guineas.

In Mechanics.—To Mr. F. Watt, for a screw-wrench, ten guineas.

To Mr. T. Eddy, 354, Oxford-street, for a screw-wrench, the silver Vulcan medal.

To Mr. G. Gladwell, 4, Lower Garden-street, Vauxhall, for an improved plane for carpenters, five guineas.

To Mr. G. Welch, 12, Mount-street, Walworth-common, for an original screw, the silver Vulcan medal and ten guineas.

To Mr. J. Duce, Wolverhampton, for a quadruple lock for safe chests, &c. the silver Vulcan medal and ten guineas.

To Ed. Speer, Esq. 7, New Inn, for concentric chucks for turners, the large silver medal.

To Captain Bagnold, 7, High-row, Knightsbridge, for an improved culinary steam-boiler, the silver Vulcan medal.

To Mr. J. Aitkin, St. John-street, Clerkenwell, for a remontoire escapement, twenty guineas.

To Mr. J. Bothway, Devonport, Plymouth, gunner in the Royal Navy, for an apparatus for raising invalids in bed, the silver Vulcan medal.

To Mr. J. Stirling, Glasgow, for a set of working-drawings of a steam engine, twenty guineas.

To Mr. R. W. Franklin, 92, Tottenham Court-road, for an improved mode of feeding the boilers of high pressure steam engines, the large silver medal and fifteen guineas.

To T. Bewley, Esq. Montrath, Ireland, for an improved mode of heating manufactories, the large silver medal.

To Mr. F. Richman, 35, Great Pulteney-street, for a method of raising a sunken floor, the large silver medal.

To Mr. A. Ainger, Everett-street, for his mode of supporting beams or other timbers, the ends of which have become decayed, the large gold medal.

To Mr. R. Soper, Royal Dock-yard, Devonport, for a pitch kettle and ladle for paying the seams of ships, ten guineas.

To Mr. W. P. Green, Lieut. R. N. for improvements in working ships' guns, the large silver medal.

To Mr. R. C. Clint, for his balanced masts, the large silver medal, or twenty guineas.

To G. Burton, Esq. Capt. R. N. for his improved mode of securing an anchor, the large silver medal.

To Mr. W. J. T. Hood, Lieut. R. N. for his improved quadrant for naval use, the gold Vulcan medal.

To Mr. G. Smart, Pedlar's Acre, Lambeth, for an improved mode of supporting the top-masts of ships, the gold Vulcan medal.

In Colonies and Trade.—To M. Chazal, Isle of France, for silk the produce of the Isle of France, the large gold medal.

To Mr. T. Kent, for preparing and importing from New South Wales extract of Mimosa bark for the use of tanners, thirty guineas.

To J. M'Arthur, Esq. Sydney, New South Wales, for the importation of the greatest quantity of fine wool, the large gold medal.

To Hannibal M'Arthur, Esq. Sydney, New South Wales, for the importation of the next greatest quantity of fine wool, the produce of his own flocks, the large silver medal.

NATIONAL GALLERY.

We mentioned in our last, that the National Gallery contained thirty-eight pictures, in which number are comprised one by Raphael, five by Claude, two by Rembrandt, three by Correggio, two by Rubens, three by Titian, and three by Vandyke; the others are by Cuyp, Gaspar and Nicholas Poussin, Annibal and Ludovico Caracci, Dominichino, Velasquez, Sebastian del Piombo, and of recent painters; Hogarth, Sir Joshua Reynolds, and Wilkie. These names will shew that the pictures are of the first order of merit; and if we mention some of them in particular, it will not be to argue in support of their acknowledged excellence, but to point out what appears to us most worthy of admiration, where every thing is sublime. We think with Sterne, that of all cants, the cant of criticism is the most annoying; and we shall speak of these paintings from our own individual impression of their beauties, and not according to the jargon of picture dealers, or with the view of exalting a favourite artist.

One of the best pictures in the gallery is No. 11, *The Woman taken in Adultery*, painted on wood, by Rembrandt. It is but small, its dimensions being two feet nine inches in height, by two feet three in width. It is, perhaps, more valuable from embodying all the peculiarities of Rembrandt's style of painting, and in particular the faculty he possessed in common with Claude (though they are the very antipodes of painting,) of pouring an almost supernatural blaze of light on his canvas, and that which he possessed more eminently than any other painter, of producing an effect really magical, by contrasting his light with the blackest darkness. The figure of the Redeemer is inimitable; the culprit herself, a tender and affecting conception of genius; but perhaps the most extraordinary part of the painting is the Pharisee, who is unveiling the woman with one hand and pointing to her with the other; the hand which is extended catches the solitary ray of light that falls from an aperture in the roof of the temple, and literally seems painted with a pencil *dipped in fire.* It is not particular for finishing, but the effect which is given to it, and the lustre it throws over the group, are grand beyond imagination; we confess at once that it could have proceeded from nothing but the inspiration of genius, and we know of no painter but Rembrandt that could have executed it. The same wonderful effect is observable on various other prominent objects, but regulated by the strictest taste and nature.

To the left of this is No. 13, *Christ Praying in the Garden*, by Correggio, likewise painted on wood, and much smaller than Rembrandt's, being only one foot two inches high, and one foot four wide; it is in fine preservation, and covered with a plate glass. It is so well known that we need but give its name, and express our unqualified concurrence in the universal opinion of its merits, for never can a figure display more of the attributes of the divine founder of our religion.

We know not which picture ought to be spoken of first, so as to give it the priority due to its merits. If we had not had a way of avoiding this difficulty by following the order of number, we should perhaps have mentioned No. 16 first. It is a *Portrait of Pope Julius the Second*, by Raphael, and though painted centuries ago, is what we can all conceive a portrait ought to be. It has none of the unmeaning insipidity and flatness of expression of modern portraits, but every feature, and even every touch of the pencil is imbued with the mind of both the artist and his illustrious patron. The colouring is rich, and as brilliant as if laid on but yesterday, and the arrangement of the drapery such as is not even dreamed of in these degenerate days. It might be looked at for a year, copied for an age, and studied for ever.

No. 20, *Pan teaching Appollo the use of the Pipe*, by Annibal Caracci. This is small, and, at a distance, insignificant; but is replete with interest, and, what may be called, the poetry of painting. The sensual expression of Pan's countenance and figure, and the mind and intellect displayed in the young god, are admirably characteristic.

No. 23, *Portraits of Philip the Fourth and his Queen*, by Velasquez. It would be no mean praise of this noble picture to say that it might very well pass for a Vandyke, of which artist, by the bye, No. 10, *The Portrait of Rubens;* and No. 19, *The Portrait of Govartius*, are two fine works. Vandyke has also an historical picture in the gallery, but, though it would be a treasure if alone, it is obscured by the splendour of the surrounding lights.

No. 27, *Christ Raising Lazarus*, by Sebastian del Piombo, thirteen feet six inches high, and nine feet five wide. This is a magnificent picture, painted originally for an altar-piece, and well worthy of its hallowed destination. It is said that Michael Angelo designed it, and if so, it is equally worthy of that master spirit. We might fill our paper with encomiums on this celebrated piece, and less would not suffice even to enumerate its various beauties; it must be seen to be sufficiently admired: and taking it for granted that all our readers will visit a collection, the sight of any one picture in which would amply recompense their trouble, we must hasten to a conclusion.

The Claudes are the richest part of the National Gallery. There are no less than five pictures of this celebrated and unequalled artist; three sea ports, and two landscapes, all with figures: they are glorious paintings, and we envy not that man's taste or judgment who can say which is the best. They are as usual characteristic of the artist's manner; the same warm flood of golden light, the same rich sunshine is thrown over them, and in pictures from a less powerful hand, would produce sameness and monotony, but these are each essentially original, for Claude was not an imitator even of himself.

No. 34, *The Rape of the Sabines*, by Rubens. If Rubens had never painted any other picture, this alone would have been sufficient to place his name in the temple of immortality. We laugh for the moment at his anachronism in dressing the Sabine matrons and virgins in the silks and satins of modern times, and according to the style of Dutch brows; but we speedily lose laughter in enthusiastic admiration of the spirit and sweetness which breathe through the whole of this great work.

We could expatiate for hours on the merits of this picture, and others, which want of room obliges us to leave entirely unnoticed; and we quit the National Gallery, sighing at the low ebb to which the most elegant and enchanting of the Fine Arts is reduced.

The paintings of English artists in this collection are Hogarth's series of Marriage à la Mode, and portrait of himself; Sir J. Reynolds's Portrait of Lord Heathfield; and Wilkie's Village Festival. Next month we shall have occasion to speak of them.

Abstracted Report of the Select Committee of the House of Commons on Machinery and Artizans, &c. continued from Vol. VII. page 276.

Mr. John Martineau (continued).—In England it does not require any great length of time to set up an extensive manufactory of machinery, we having such facilities of obtaining tools of every description; but in France it would take a considerable time. The prohibitory laws existing here have a tendency to compel factories of machinery to be established in France which otherwise would not be necessary. The additional price put upon machinery exported to cover the risk of smuggling is very small, from its being so seldom detected. If a manufacturer has an inclination to violate the law, there is no great difficulty in doing it. Some months since a considerable seizure of cotton machinery intended for exportation took place in London, which perhaps will in future make manufacturers more cautious, but previous to that the risk was very small indeed, there having been very few seizures of late years.

Specifications of every new machine, with drawings, may be obtained from this country, and which is done every day. The deponent in conversing lately with an opulent cotton manufacturer, from France, was distinctly told that there was no model or machine in England of which he could not obtain a copy, by paying for it*. The drawings and specifications are so complete, that when carried abroad, an expert English artizans can make up the machines; hence the prohibitory laws existing are defeated by these facilities being afforded.

Some of the gold medals and other premiums, or rewards, for improved machinery, exhibited in the Louvre, have been bestowed upon Englishmen. Mr. Manby has established iron steam-boats on almost every river in France, the machinery of which was entirely exported from England.

The principal exportations of the deponent have been such machinery as appertained to oil gas works; he has also exported some other articles, chiefly steam-engines.

At each of the principal manufacturies of iron in the neighbourhood of Paris, (Chaillot and Charenton,) there are from three to five hundred English smiths employed; these are almost exclusively engaged in making machinery. The rolling mills, and other apparatus employed there, were obtained from England; these rollers vary much in weight, a complete set might, with its framing, amount to thirty or forty tons: it is probable they were sent in pieces. Mr. Manby, the superintendent at Charenton, has been prosecuted for the seduction of English artizans abroad; he has entered into a bond not to offend again. The machines made at both these establishments are of very excellent workmanship; the materials are much inferior to English. It is probable, in the event of repealing our prohibitory laws, the importation duties in France would be increased. The restrictions extend to common tools, screws of any kind beyond half an inch in diameter, and dies for the making of screws, but not files or pickaxes, or spades, or common articles of that kind.

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* This remark probably refers to the patents.—EDITOR.

An English smith will receive ten or eleven francs a day in France, while in London the same men would obtain but six and six-pence, or seven shillings; if all impediments to Englishmen going to France were removed, the price of wages there would decrease, consequently the articles might be manufactured cheaper.

The deponent has sent a considerable quantity of machinery to Russia for the Emperor's use, but they were none of them prohibited articles. The exportation of tools under disguise, is supposed to have been very extensively carried on, but less so since the establishments formed near Paris. Though we are prevented from sending screws, dies, and many other articles abroad, yet we are permitted to send the machines in which these articles are made, if they can be worked by a boy of twelve years old; we thereby deprive our own countrymen of a profitable branch of manufacture, and give it to a foreign country, which would be remedied by the repeal of the law.

When machinery is sent abroad, it is generally necessary to send workmen to erect it, whether this is to be considered as an infringement of the laws is a question which the deponent intends to contest if he is driven to it. For though the act expressly prohibits any artizan from going abroad to "exercise his craft," yet there is a clause immediately following, which states, that an English artizan residing abroad must, after receiving notice from the ambassador, return to this country within six months, which, it is presumed, was meant to meet such a case as that last mentioned; it is, therefore, considered that the meaning of the law is not to prohibit artizans from going out of the country, though the letter of the law so expresses it.

Notwithstanding the prohibitory laws, artizans quit the country now in as great numbers as they would, probably, if the acts were repealed; they are enticed abroad both by Englishmen and foreigners; the best workmen are invariably enticed over, and considerable bribes are given. The deponent has had many of his best workmen enticed over to Chaillot, and at a time when they were employed upon experimental works, which were intended to have been the subject of a patent. Two Englishmen have lately come over, with the object of drawing away the workmen of the deponent; having previous intimation of their intentions, he made the matter known in his manufactory, but none of the men left, though the offers appeared to be very advantageous. If the laws were repealed, the most inferior workmen would be first induced to go, from the difficulty of procuring employment here; the best hands would scarcely ever leave their country, if they were not induced by high bribes; most of those who have left the country would be glad to return, were they not prevented.

If the laws were repealed so as to leave it a matter of perfect freedom to go or not, very few workmen worth keeping would be induced to quit their native country. Many Englishmen are prevented from returning, their passports having been refused by the interference of the masters with the French police. As the repeal of the laws would necessarily reduce the wages of these men in France, that circumstance alone would be sufficient to prevent their emigrating.

The penalties of the law have often been enforced by masters against the workmen; they have lately, in the neighbourhood of Tipton, Staffordshire. The risk is trivial on the part of the men; they have only to give bail to appear at the next quarter sessions, and enter into a bond not to quit the kingdom. The penalties are incurred by those persons who bribe and seduce them away; hence it is only worth while to procure the best hands, as, beside the risk, the expence of the bribe, and conveyance to France, generally amounts to 50*l.* per man.

The French manufacturers would not have the same motive for offering high wages to our best workmen if the laws were repealed, because they would be supplied with an inferior class of workmen, and would probably feel satisfied with them.

There does not appear to be, in any country in Europe, except Russia, laws of the nature of those in England, which prohibit artizans from leaving their country.

(To be continued.)

New Patents Sealed, 1824.

To John Hobbins, of Walsall, in the county of Stafford, ironmonger, for his invention of improvements in gas apparatus. Sealed 22nd June: 2 months for inrolment.

To John Benton Higgin, of Gravel-lane, Houndsditch, in the county of Middlesex, gentleman, for his new improvement or addition to carving knives and other edged tools. Sealed 22nd June: 2 months.

To Humphrey Austin, of Alderley Mills, in the county of Gloucester, manufacturer, for his invention of certain improvements on shearing machines. Sealed 22nd June: 6 months.

To William Busk, of Broad-street, in the city of London, merchant, for his invention of certain improvements in the means or method of propelling ships, boats, or other floating bodies. Sealed 29th June: 6 months.

To William Pontifex the younger, of Shoe-lane, in the city of London, coppersmith and engineer, for his new invented or improved modes of adjusting or equalizing the pressure of fluids or liquids in pipes or tubes, and also an improved mode of measuring the said fluids or liquids. Sealed 1st July: 6 months.

To John Leigh Bradbury, of Manchester, in the County Palatine of Lancaster, for his invention of a new mode of twisting, spinning, or throwing silk, cotton, wool, linen, or other threads or fibrous substances. Sealed 3rd July: 2mo.

To Philip Taylor, of the City-road, in the county of Middlesex, engineer, for his invention of certain improvements on steam engines. Sealed 3rd July: 6 months.

To John Lane Higgins, of Oxford-street, in the county of Middlesex, Esq. for his invention of certain improvements in the construction of the masts, yards, sails, and rigging of ships and smaller vessels; and in the tackle used for working or navigating the same. Sealed 7th of July: 6 months.

To William Hirst and John Wood, both of Leeds, in the county of York, manufacturers, for their invention of certain improvements in machinery for the raising or dressing of cloth. Sealed 7th July: 6 months.

To Joseph Chisild Daniell, of Stoke, in the county of Wilts, clothier, for his invented or new improved method of weaving woollen cloth. Sealed 7th of July: 2 months.

To Charles Phillips, of Upnor, in the parish of Frindsbury, in the county of Kent, Esq. for his invention of certain improvements on tillers and steering wheels of vessels of various denominations. Sealed 13th July: 6 months.

D.	H.	M.	S.	
1	0	0	0	⊙ declination 18° N.
1	0	5	0	♀ Passes the merid. dec. 18° 55′ N.
1	5	25	0	☽ passes the meridian.
1	9	55	0	☽ in □ first quarter.
1	23	5	0	♃ passes the meridian, declination 21° 10′ N.
3	9	0	0	☽ in conj. with σ in Scorp.
4	12	0	0	☽ in conj. with ϑ in Oph.
4	14	0	0	☽ in conj. with B. in Oph.
5	4	0	0	♄ in conj with ε in Taurus
6	0	0	0	⊙ dec. 16° 40′ 36″ N.
6	5	0	0	☽ in conj. with 1 ν in Sag.
6	9	47	0	☽ Passes the meridian.
6	10	0	0	☽ in conj. with ο in Sag.
6	12	0	0	☽ in conj. with π in Sag.
6	18	0	0	☿ in conj. with α in Leo.
9	7	32	0	Ecliptic opposition ⊙ full moon.
10	10	0	0	☿ in conj. with ζ in Leo.
11	0	0	0	⊙ dec. 15° 14′ 31″ N.
11	13	26	0	☾ passes the meridian.
13	0	18	0	♀ passes the merid. dec. 14° 35′ N.
13	22	30	0	♃ passes the merid. dec. 20° 40′ N.
14	21	0	0	♀ in conj. with α in Leo.
14	22	0	0	☾ in conj. with η in Pisces
16	0	0	0	⊙ dec. 13° 42′ 18″ N.
16	17	6	0	☾ passes the meridian.
17	8	32	0	☾ in □ last quarter.
17	13	0	0	☾ in conj. with η in Taurus
21	0	0	0	⊙ dec. 12° 4′ 36″ N.
21	2	0	0	☾ in conj. with δ in Gemini.
21	21	54	0	☾ passes the meridian.
22	18	17	0	⊙ enters Scorpio.
23	8	0	0	☾ in conj. with ξ in Leo.
24	2	27	0	Ecliptic Conjunction ● New Moon.
24	7	0	0	☿ in conj. with B in Scorp.
25	0	30	0	♀ passes the merid. dec. 9° 18′ N.
25	21	57	0	♃ passes the merid. dec. 20° 9′ N.
26	0	0	0	⊙ declin. 10° 22′ 5″ N.
26	1	35	0	☽ passes the meridian.
28	4	0	0	♂ in conj. with 2 α in Libra
30	7	0	0	☽ in conj. with δ in Scorpio
30	20	48	0	☽ in □ first quarter.
31	0	0	0	⊙ dec. 8° 35′ 27″ N.
31	6	5	0	☽ passes the meridian.
31	18	0	0	☽ in conj. with ϑ in Oph.
31	20	0	0	☽ in conj. with B in Oph.

Rotherhithe. J. LEWTHWAITE.

The waxing moon ☽—the waning moon ☾.

METEOROLOGICAL JOURNAL, JUNE AND JULY, 1824.

1824.	Thermo.		Barometer.		Rain in inches.	1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	–			Higt.	Low	+	–	
JUNE						JULY					
26	74	47	29,96	29,89	..	11	78	47	29,99	29,97	..
27	70	44	,96	—,90	..	12	78	54	30,00	—,96	..
28	74	50	,88	—,87	..	13	82	49	,00	station	..
29	77	46	,70	—,67	,075	14	79	56	29,93	29,83	..
30	67	45	,80	station	..	15	77	56	,94	—,84	,65
JULY						16	75	54	30,04	30,02	..
1	72	47	,80	—,68	..	17	75	54	,19	—,14	,05
2	71	52	,55	—,50	,075	18	72	53	,30	—,19	..
3	67	56	,57	—,55	,025	19	77	48	,38	—,33	..
4	69	52	,83	—,58	,75	20	76	48	,35	—,29	..
5	73	47	,93	—,81	..	21	77	49	,20	station	..
6	64	48	,86	—,79	..	22	77	52	,22	—,20	..
7	69	54	,82	,77	..	23	78	50	,16	—,02	..
8	76	55	,96	—,93	,075	24	80	52	29,90	29,80	..
9	79	58	,93	—,85	..	25	76	51	,65	—,83	..
10	77	50	,95	—,87	,15						

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

The Second Part of Captain Batty's Views on the Rhine, has made its appearance, and is well entitled to every praise. The views are perfect gems, and though executed by various artists display a unity of excellence which might increase the fame of the most popular among them. The scenes are extremely various, and exceedingly picturesque. The engravings are beautifully executed, and embrace the main essentials of clearness and effect, and are highly calculated to keep up the commendations bestowed upon the preceding part of this work.

The Historical Works of Sir James Balfour, of Kinnaird, from Original MSS. in the Advocate's Library, Edinburgh, are advertized for publication by subscription, in 4 vols, 8vo.

Dr. Evans, of Islington, has a volume in the press entitled "Richmond and its Vicinity, with a Glance at Twickenham, Strawberry Hill, and Hampton Court."

The Second Number of Mr. Williams's Grecian Antiquities, containing Views of Corinth, Thebes, Mount Parnassus, Temple of Jupiter, Panhellenius, the Acropolis, and Athens, is nearly ready.

The First Part of the Monumental Remains of Noble and Eminent Persons, comprising the Sepulchral Antiquities of Great Britain, with historical and biographical illustrations has been issued from the press. The engravings are made from drawings by E. Blore, F.S.A. and are executed by H. Le Keux, they contain representations of the Tomb of Edward the Black Prince (Canterbury). The Monument of Thomas Hatfield, Bishop of Durham, (Durham). The Monument of Archibald, 5th Earl of Douglas, (Douglas in Scotland,) and the Monument (thought to be) of Gervase Alard (Winchelsea); of which five engravings the part consists, all of which are singularly beautiful, and reflect the highest credit upon the talent that has been employed, and we hope the publishers will be liberally rewarded for presenting the nation with a Work that shews so pre-eminently the high state of advancement of the Fine Arts in this kingdom.

M. De Barante, is about to publish an important historical work, entitled the History of the Dukes of Burgundy, the first two Volumes have made their appearance, and the work is to extend to twelve; it is said that the copyright of this work has been purchased for 48,000 francs, by M. Ladvocat. The volumes containing about 300 pages, 8vo.

Premiums have been offered by the Directors of the British Institution for finished sketches of those great Naval Victories the Battles of the Nile and Trafalgar, with a view of ordering two pictures to be painted of those subjects, provided the sketchings are approved. Their destination is to be the Painted Hall of Greenwich Hospital, which is now appropriated to a Picture Gallery. The Premiums offered are for the best sketch, £200 and the next best £100.

Mr. P. Nicholson and Mr. Rowbotham, are about to publish a Practical System of Algebra.

Dr. Dawson of Sunderland, is preparing for publication a New System of the Practice of Physic; together with an original Nosology, which embraces Physiology and Morbid Anatomy.

We have perused with much pleasure the New European Review, a work recently published with the professed object of giving a monthly picture of the arts and literature of all nations, divested of prejudice and party-feeling. It would, however, be a solecism to review *a review;* and we must therefore, in this brief notice, confine ourselves to a warm approval of the style and temper in which it seems likely to be conducted, and a general recommendation of it to our readers, as a work combining the two (generally opposite) merits of talent and impartiality.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLV.

Recent Patents.

To WILLIAM BUNDY, *of Fulham, in the County of Middlesex, Mathematical Instrument Maker, for a Machine for breaking, cleaning, and preparing Flax, Hemp, and other vegetable Substances containing Fibre.*

[Sealed 16th December, 1822.]

THIS machinery for breaking and removing the boon from flax, hemp, and other fibrous substances, consists of a series of vibrating beaters connected together, and actuated by eccentric rollers, which may be put in operation by manual labour, a water-wheel, steam-engine, or any other suitable means.

Plate V. fig. 1, is a perspective representation of one of these machines; and fig. 2, is a section of the same cut across, shewing more evidently the internal construction of the operating parts, the respective letters referring to the same in both figures.

There is an external frame-work or standard to which the working parts of the machine are attached, and within this are the rocking-frames *a a*, carrying the indented ribs into which the vibrating beaters strike. These rocking frames are capable of falling back upon hinge joints at bottom, (as seen on the right-hand side in fig. 2,) for the purpose of introducing the rough flax; *b* are the lower beaters, and *c* the upper beaters, of which there are six in each machine. To each of the lower beaters two rows of teeth or grooves *d*, are attached, and to the upper beaters two rows of smaller teeth *e e*; these when the beaters vibrate are intended to strike into the corresponding rows of teeth or grooves in the rocking-frames.

There are two shafts *f* and *g*, extending through the machine: to one of these a rotatory motion is given by means of a winch upon its end, or a rigger or band wheel, may be attached and actuated by any first mover; which rotatory motion is communicated to the other shaft by the gearing of a pair of toothed-wheels, respectively attached to the ends of the shafts, but not seen in the view.

Upon these shafts *f* and *g*, there are fixed eccentric rollers *h* and *i*, corresponding in number to the beaters, in the crutched part of which they act, and by their excentric revolutions cause the beaters to vibrate.

A quantity of the rough flax or hemp in the stem being provided, it is to be spread out evenly upon a flat surface, in portions of about one pound, more or less according to its length; it is then to be confined by the root ends between a pair of clams *k k*, which are afterwards placed in front of the machine and hooked to the ends of cords, as shewn in the perspective view, with the flax hanging down between the beaters and the rocking-frame, as at *l l*, fig. 2.

The rocking-frames *a*, laying as on the right-hand side of fig. 2, are now to be raised up from their inclined positions by a lever *m*, to the erect situation of *a*, on the left-hand side, and then made fast by the bearing arms *n n*, falling into notches in the rail of the frame. Rotatory motion being now communicated to the shafts *f* and *g*, as above described, the excentric rollers *h* and *i*, will cause the beaters *b* and *c*, to vibrate and strike the flax between the teeth or grooves of the rocking-frames, and thereby break the boon or woody parts; but in order to prevent the fibre from being crushed by the violent concussion of the beating, a small degree of elasticity is given to the rocking-frame by means of a slit or opening cut down behind it.

At the end of the shaft *f*, there is an endless screw, which is intended to actuate the toothed wheels and axles *p p*, (see fig. 1,) for the purpose of coiling upon the axles the cords that draw up the clams *k k*, by which means the suspended flax is slowly raised, and the beaters enabled to operate upon every part of it from end to end.

When the clam has ascended sufficiently far up the machine to have drawn the whole length of the flax through the teeth of the beaters, the rocking frame *a*, is thrown back, and the wheel and axle *p* drawn out of gear, by the clam striking against an arm *q*, which hangs down in the middle of the machine. These arms *q*, are connected to levers and rods seen at the end of the machine in the perspective view fig. 1, and thereby throw that part of the machinery out of action when the flax has passed the teeth.

The clams with the flax will now descend by their own gravity, and the operation may be repeated several times until the boon is sufficiently removed from the part of the flax acted upon. The clams may then be taken out, and the ends of the flax turned and operated upon in like manner until it has become perfectly cleansed.

In order to loosen or separate the fibre and clear off the boon after being broken, a row of needles, or hackle points, are employed as seen attached to a rail extending along the front of the machine at *r r*, fig. 1, and also a lath *s s*. The rail which carries the points is connected by arms to a shaft having a strong helical or worm spring; the lath is also connected to a similar shaft, and the springs impel them inwards, so as to enter or press against the flax. These points and lath are withdrawn from the flax at every stroke of the beaters, by means of a small arm, against which the beater strikes, and on the return of the beater the points again penetrate the flax and separate its fibre.

The specification concludes by saying, "As the machine above described is composed of many mechanical agents and parts, which are common to a variety of other pieces of mechanism, I do not claim any of those agents or parts as new in themselves, distinct and away from their present combination and object; but the construction of a machine applicable to the breaking and clearing of flax or other material from boon, by means of vibrating beaters with indentations: the pressure to the line of beaters being given in regular divided times by excentric wheels on the shaft, so that each beater head having two reversed faces gives two pressures in every return of the shaft; the contrivance for progressively passing the length of the flax between these beaters; the springs which are part of the frames that receive the pressure from the beaters; the regular mode of passing fine hackles or needle points through the flax incessantly, while the operation of breaking is going on; and likewise adapting the same to be worked by power upon the principle above described, being to the best of my knowledge and belief entirely new and my own invention, I claim the sole privilege and right to the said combination.

[*Inrolled, June*, 1823.]

To HOWARD FLETCHER, *of Walsall, in the County of Stafford, Saddler's Ironmonger, for his Invention of certain Improvements in Tanning Hides and other Skins.*

[Sealed 19th January, 1824.]

THIS patent is not for any improvement in the materials employed in the process of tanning, but for a new mode of operating; viz. forcing the tanning matter into the skins by hydrostatic or pneumatic pressure, by which means the operation of tanning is effected in a much shorter space of time than by the ordinary mode, and by which means the leather is rendered equally tough and firmer than when tanned by the means heretofore practised.

The skins or hides are to be cleansed and prepared in the common way, and then introduced into vessels containing the tanning matter, which vessels are to be closed and rendered air and water tight. If the tanning process is to be carried on upon a large scale, pits may be constructed and lined with lead, or vessels of cast iron or of wood, firmly bound together with iron and lined with lead, may be inserted into the ground: such a vessel is shewn in Plate VI. at fig. 12, measuring about five feet by four feet, and six feet deep, and made sufficiently strong to sustain a considerable internal pressure. Projecting pegs are set round the vessel about four inches in length for the purpose of attaching eyed bolts as *a*, which are to slip on to the pegs and pass through holes in the edge or flange of the lid, the nuts being then screwed up will make the lids fast; *b* is a stopcock leading to a waste-pipe, *c* is a wooden post with a hook at top, for a ring in the back of the lid to hang upon when open; *d d*, are two notched pieces, through each of which a pin is to pass for the purpose of making a hinge joint for the lid to turn upon; *e* is a long pipe or column to be attached to the vessel by a coupling screw-box, or otherwise, and having a stop-cock; at the top of this pipe is a tub or other receptacle, containing the fluid which is to produce the hydrostatic pressure.

Let it now be supposed that the vessel is filled with the tanning matter, that the skins or hides are immersed in it, and that the lid is placed on and made fast so as to render the vessel water-tight; the stop-cock of the column is then opened, and the liquor from the reservoir above allowed to flow down and press upon that contained in the vessel, upon the same principle as the hydrostatic press, the force generally employed in this operation being about nine or ten pounds upon the square inch, which will have the effect of pressing the tanning liquor into the pores of the hides.

The same effect may be obtained by means of condensing air within the vessel, that is forcing it in by a condensing pump, so that the pneumatic pressure may act upon the surface of the fluid and force the tanning matter into the pores of the skin.

The tanning process is to be carried on in this way, the skin being removed from the pit daily, and after draining replaced in the pit again as before. As the same quantity of bark will be required as heretofore, it is obvious that the liquor must be stronger, but this is only requisite in the latter stages of the process. No precise time can be stated for the continuance of the operation, as that will depend upon the substance of the skin; and the improvement is to be considered as consisting simply in the employment of air-tight and water-tight vessels, pits, or receptacles, into which the skins are to be immersed for tanning.*

[*Inrolled, May,* 1824.]

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* See Spilsbury's Patent for Tanning, Vol. VI. page 285.

To William Hase, *of Saxthorpe, in the County of Norfolk, Iron Founder, for his Invention of a new Method of Constructing Mills, or Machinery, chiefly applicable to Prison Discipline.*

[Sealed 11th September, 1823.]

This invention is applicable to the tread-mill machinery, lately introduced into prisons, for the employment of felons. The patentee proposes that the buildings in which the tread-mills are placed, should be so constructed that the prisoners can be made to work separately if necessary, or in small parties of six or eight, in distinct compartments, the separations between each party being such as will prevent conversation. The compartments are to be provided with strong iron grating, and a gate in front to admit the prisoners to the stepping wheel, but every possible care should be taken to give a free access of air.

In place of a hand rail usually employed to hold by, a reel or set of revolving rails moving slowly is to be adopted. The rotation of this reel is to be produced by an endless band or chain, or by gear work connected to the tread-mill, so that the hands of the prisoner may contribute to turn the mill as well as his feet; the advantages proposed by this revolving reel are, that the height of the hand rails will be always suited to the different heights of men and boys, and also that it will give exercise to the hands and arms, the want of which has been objected to in the existing tread-mills. The axis upon which this reel is to revolve, must be furnished with a ratchet and pall, so that the prisoners can hold it still if they please, but then their whole labour will be exerted upon the stepping wheel.

In order to prevent the necessity of the constant attendance of an overseer, the whole floor next the stepping wheel within the iron grating is to be suspended by levers, either upon the principle of the weighing machines, or of an ordinary scale beam, or by any other convenient means, so that the floor shall descend when ever a greater number of prisoners are off the wheel than are by the regulation intended. This descent of the floor is also intended to move an index placed in the governor's room, or ring a bell, or give any other signal of the insubordination.

One principal feature in the invention, as claimed by the patentee, is the attachment of a pump, or pumps, to be worked by the tread and hand machinery. These pumps may be of any construction either rotatory or alternating, and the water raised by them, is to be forced into an air vessel, the elasticity of which is to be the means of equalizing the action of the machinery. It is likewise intended by these pumps to raise water for the purpose of conveying it to a distance, and after conducting it through pipes to pass it into any of the rotatory engines now in use, which engines will thereby be enabled to give a rotatory power, capable of actuating any other kind of machinery.

There are no drawings accompanying this specification, but it is considered that by such contrivances as those described, the power exerted by any number of prisoners may be conveniently communicated to a manufactory at any distance, and the patentee observes "what has hitherto proved injurious to the fair trader, will now be rendered of the greatest use, as the power produced by the labour of prisoners may be let for any term of years."

[*Inrolled, November,* 1823.]

To Sir William Congreve, *of Cecil Street, Strand, in the County of Middlesex, Bart. for his Invention of an Improved Method of Stamping.*

[Sealed, 7th February, 1824.]

This improvement consists in a mode of stamping paper, vellum, leather, and other substances, at one operation, so as to produce the most beautiful embossed work, combined with printed figures, either in one or more colours, or in silver or gold. This mode of stamping is intended to be employed particularly as a protection to the revenue, and generally to increase the security of any document against forgery; its applicability extends also to a great variety of ornamental works.

It is proposed to be applied to the stamping of receipts, bills of exchange, bank notes, &c., and may be used for the borders of local notes, so as to render the forgery of them extremely difficult. It may also be used for ornamenting the borders of tickets, cards, or paper of any sort, and also for ornamenting leather, vellum, &c., upon chairs, screens, and other descriptions of goods or furniture.

The difficulty of this process is its protection and security against imitation; for to produce the imbossed work in high perfection, the paper or other substance worked upon must be dry, this circumstance presents a very great impediment to printing fine work, which indeed is not to be accomplished upon a dry surface sized for writing upon, and cannot be avoided here, as the effecting of register requires, that the stamping and printing should be done at the same time. By separating the two processes of printing and stamping the register could not be effected, for by damping the paper as in the ordinary process of printing, it would be impossible to obtain a correct union of the several parts and colours of a complicated device, as the shrinking or expanding of the substance would prevent a perfect register from being afterwards obtained, when introduced into a stamping press.

To overcome this difficulty, the patentee finds it necessary not only to use a press of extraordinary power, but to impress the paper or other substance between two metallic surfaces, instead of one metallic surface and a surface of leather, as in the ordinary mode of stamping. The counter part of the die, must therefore be a permanent impression, so that a steel die requires a copper force, which must in the first instance be struck as a model from the die,* and this involves an additional and difficult process in the operation of the engine necessary for such a stamp, and the engine itself must be of an extremely accurate construction and adjustment to insure these metallic counterparts, that is, the steel die and its copper force to come together at every impression, without injury to either.

These difficulties require expensive machinery, the whole of which are involved in the process by which the printing and embossing are united in one operation, and care must be taken in forming the device, that the printing shall be so mixed with the embossing, " that the delicacy of the register shall prevent those operations being performed separately."

In stamps and other securities of considerable value, it is proposed to unite the register of different colours with the embossed work, by means of the compound plates, for which the present inventor obtained a patent in 1819, (see Vol. I. page 241 of this Journal.)

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* See Perkins's patent for transferring engraved, and other work from the surface of one piece of metal to another piece of metal, and for the forming of metallic dies and matrices, &c., Vol. I. page 159 of this Journal, with plates of the machinery.

The extreme precision of register required between the two distinct operation of printing here and stamping performed at once, is not of so much importance in the generality of ornamental work, yet the beauty and perfection of the operation will tend greatly to recommend it for such purposes as the embossing and gilding or silvering of vellum, leather, and such other materials for furniture, and the combining of the two operation in one, gives a celerity to the process.

There are no drawings accompanying this specification.

[*Inrolled, August,* 1824.]

To John Dowell Moxon, *of Liverpool, in the County of Lancaster, Ship owner and Merchant, for his improvements in the Construction of Bridges, and works of a similar nature.*

[Sealed 9th November, 1822.]

The first part of the plan proposed herein, applies to the construction of coffer dams, that is the walls or casings erected about the foundations of Bridges, and other aquatic buildings, for the purpose of excluding the water during the progress of the work. The patentee proposes to form his coffer dams of wooden framing open at bottom, with joints at the angles, by which they may be enabled to open when they are about to be removed. The principle object contemplated, in making those coffer dams of wood, is, that they may be floated from one place to another without taking to pieces. They are constructed of perpendicular ribs, with cross boarding, leaving a hollow space within, and have iron rods intended to act as piles at the corners, sliding in sockets.

These framings having been brought over the spot where the pier is intended to be erected, are there to be made steady until the descent of the tide brings them to a settlement; the iron piles are then to be driven firmly down, which fixes the coffer dam, and the lower edge of the framing being of a wedge form, penetrates into the ground; clay and rubbish is now to be poured down into the hollow space, between the planking of the frames, so as to constitute a wall of earth by which the space within the coffer dam is rendered water-tight, and after pumping the water out of the coffer, the erection of the pier is enabled to proceed.

The second part of the invention is a mode of fastening the stones together by iron clamps, and of casing the outside of the masonry with cast iron plates, formed to resemble the stones. There are several modes of doing this proposed, one of which is a series of iron boxes clamped together by means of their own indented surfaces: these are to form the outsides of the work and the arches, and from these are to extend clamps, which are to pass into the masonry, all of them being hooked together by angles and notches, instead of being bolted and screwed, or cemented. The stones which are to form the pier, may for some distance inward be deposited in these iron boxes, and the stones in the interior may be held together by clamped irons; which modes of uniting the masonry, even though inferior stone is used, will afford a degree of strength not before attained. This plan is particularly suited to fortifications, and other erections where force either of nature or art is likely to be exerted; and the stone being thus excluded from the action of the weather, frost will not be liable to affect it.

The piers of bridges are proposed to be coated in this way with cast iron up to the springing of the arch, and the arches may be formed by ribs of cast iron, let into grooves in the stone. These ribs are to be of unequal lengths so as to block the joints of each other, and are to be held together by indentations as before described. The iron flooring for the support of the road way, is to lay immediately on the top of the arch, and when the spaces between are filled up, there will be little or no vibration or noise when heavy carriages pass over, as is the case in iron bridges.

The particular novelty in this part of the invention, is, that the iron is fastened together, by clamping its projecting angles against corresponding indentations, so that the whole is held as one compact framing, without bolts, screws, or cement, and will be less likely to contract or expand by the changes of temperature, than if attached by bolts. Iron joined in this way will give a stable foundation in places that are not uniformly firm, as parts cannot sink without the whole giving way. The plan is applicable to a variety of other situations besides the piers of bridges; such as wharfs, lighthouses, &c., and the additional expence of the iron work will be fully compensated for by the facilities which it affords in erecting.

[*Inrolled, May*, 1823.]

To WILLIAM PALMER, *of Lothbury, in the City of London, Paper Hanger, for certain Improvements in Machinery, applicable to printing on Calico or other woven Fabrics, composed wholly, or in part, of Cotton, Linen, Wool, or Silk.*

[Sealed 15th July, 1823.]

THIS apparatus for printing calico and other woven fabrics, is very much in principle like an apparatus for printing paper hanging, for which the same William Palmer obtained a patent in April, 1823, (see our sixth volume, page 186.) The machine at present proposed is shewn in Plate V. fig. 3, and consists of a cast-iron frame supporting the mechanism, which is actuated by a winch and the movements are regulated by a fly-wheel.

The fabric intended to be printed is extended smoothly over the feeding roller *a*, passed under the guide-roller *b*, (both shewn by dots) and on to the endless web *c c*, to which it is made fast. This endless web is distended over a drum behind the wheel *d*, and over the small roller *e*, and is drawn forward at stated times by means of the lever and handle *f*, which is by a locking apparatus connected to the wheel *d*, upon the shaft of the drum. This locking apparatus is furnished with two stops, which are capable of adjustment, so as to regulate the advance of the drum carrying the endless web, and by that means exactly so much of the fabric is brought forward at every advance of the lever and handle *f*, as the block would cover, so as to meet and join the pattern or device produced by the last impression of the block; the lever *f*, unlocking itself upon its return.

The handle of the crank *g*, being moved in the direction of the arrow, will cause the rods and cranks, or compound levers, to bring down the printing-block *h*, on to the table *x*, which supports the fabric, and thereby the impression is given; the situation of the parts at that time being as represented by the dotted lines. On carrying the handle forward in its revolution, the driving crank *g*, will again raise the block into the position seen in the figure, when the toothed sectors connected to the shafts of these levers will, by means of cranks, raise the parallel frame *k k*, with the inking or colouring apparatus, and a bow *j*, the string of which is passed over a pulley on the axis of the inking-roller *i*, will carry it along in contact with the surface of the block, and communicate the ink or colour thereto after every impression.

The printing-block proposed to be employed is intended to cover only one-third of the width of the fabric, it is therefore made to slide laterally upon a horizontal shaft with its carriage, and with the carriage of the sliding roller or inking apparatus, which is moved by an endless cord or chain passing over pulleys *l*, and having points or stops to bring it to a perfect register or junction with the edge of the preceding impression; if however a block is adapted of corresponding width to that of the fabric, this lateral movement and its adjustments will not be necessary.

If the pattern to be printed consists of several colours the operation must be repeated, and the block and colouring apparatus exchanged. When the entire surface of the calico has, by a succession of operations, received the first impression, it may be laid in folds upon the floor, and the end of the piece again brought over the feeding roller *a*, under the guide roller *b*, and on to the endless web *c*, as before described, ready for printing the second colour. The calico having been carefully distended, the proper colour supplied, and the register adjusted, similar movements of the machine to those above described, will produce the second or any of the succeeding impressions, in as many different colours as the pattern may be designed to represent.

The patentee says, "in order to identify and distinguish the improvements I have invented, I hereby declare that I claim, 1st. The application of the driving crank and driving rods for the purpose of raising the printing blocks and giving pressure thereto. 2nd. I claim the application of the principal crank and the parallel crank; the first for supporting the block-carriage and block, and the second for preserving the parallel position of the block. 3rd. I claim the application of a cord or a chain for the purpose of shifting the block-carriage and block. 4thly. I also claim the combination and connection of the block-carriage with a sliding roller frame, by means of a sliding piece and guiding groove, by which combination, when the one moves laterally, the other moves also. 5th. I claim a bow and pulley as combined with a block-carriage and a colour-roller frame, by which combination a continual connection is maintained between the parts in every position."

[*Inrolled, January,* 1824.]

To ROBERT DICKINSON, *of Park-street, Southwark, in the County of Surrey, Esq. for his Invention of an Improvement in Addition to the Shoeing or Stopping, and Treatment of Horses' Feet.*

[Sealed 5th August, 1823.]

THE object of the inventor is to support the central part of a horse's hoof, which in the ordinary mode of shoeing is suspended over a hollow. The patentee says, " that by the methods of shoeing heretofore adopted, the whole weight of the animal when standing is made to bear upon the outer edge of the sole, and the frog or tough elastic central parts of the foot which nature appears to have intended to bear a portion of the weight, is raised and removed altogether from contact with the ground. By these means, one of the most considerable members of the foot is thrown completely out of action, and the whole weight of the animal is suspended upon the crust or front circumference of the hoof. The proper distribution of pressure upon the foot by throwing a portion of it upon the frog and sole is very generally admitted; and it is a want of proper attention to this circumstance that produces some of the disorders to which the feet of horses are liable."

The principal design of the present inventions therefore are to produce this pressure upon the frog and sole, and to make the pressure variable according as the case may require, as well as to maintain such a proper quantity of moisture at all times upon the foot as shall prevent its becoming hard and cracking. To produce these desirable objects an apparatus is proposed, as shewn in Plate VI. at fig. 1, and edgewise at fig. 2, its size, form, and dimensions varying according to the foot for which it is intended. This apparatus is called a rester. It consists of a stiff piece of leather or felt *a a a*, which may be called the base, to be introduced into the shoe; and on the upper side of this, next to the horse's foot, two pieces of sponge or other thick porus substance *b b* are to be attached, by stitching or otherwise; this is intended to fill up the hollow of the foot and surround the frog as nearly as possible, and consequently must be made in thickness to correspond thereto. This spongy substance is intended to retain water or any other fluid for the purpose of keeping the foot moist. On the under side of the base a pad, as *c*, fig. 2, is also to be attached, which must be of sufficient substance to come down below the shoe, so that when the horse steps on the ground the pad *c* will press upwards and cause the hollow part of the hoof to have a solid bearing: a vertical section of which is shewn at fig. 3.

When it is found necessary to make the base *a* of a soft material, it is then proposed to place small projecting pieces, as *d d d*, fig. 4, which are to take hold of the inside of the shoe, and when it may be necessary from the diseased state of the foot to displace the resters frequently, the holdfasts of thin plate iron, figs. 5, 6, and 7, are to be employed, with the edges *e e* resting between the foot and the shoe, and the parts *f f* moveable upon centers, for the purpose of fixing or displacing the resters at pleasure.

In some cases the pads or sponges *b b* may be employed without attaching them to the base, and then a base of any stiff material may be introduced for the purpose of holding them in. For the purpose of giving support to feet of the greatest depth, bags are sometimes to be employed, as fig. 8, with a division or partition between the upper and under parts, and a stiff projecting edge, which is to be placed between the foot and the shoe in order to hold it in its situation. Into the upper part of this bag a soft spongy material is to be introduced for the purpose of retaining moisture, and into the lower part shavings of leather, or a piece of wood or other hard substance, so as to afford resistance.

Another mode adopted is that shewn at fig. 9, which is an artificial frog of iron, or other hard substance *g*, having a spring of steel fixed across it at *h h*; the ends of this spring go between the shoe and the foot, and bear the artificial frog upwards against the natural frog of the foot.

These expedients are only intended to be employed when the horse is in the stable, and by varying them according to circumstances, a much more efficient stopping of the foot, pressure on the frog and sole, and application of moisture is obtained, than by any other means heretofore employed for that purpose.

These improvements may however be adapted to the feet of a horse when at work in the following manner: having cleaned and prepared the foot in a proper state for receiving the apparatus, its hollow part is to be stopped with a padding, so as to make it level with the apparatus, the base of which is proposed to be made of sheeps' skin tanned with the wool on, and this may be attached to an iron frog with its spring, as at fig. 9, and if required, may be padded as fig. 8. The shoe is now to be fixed to the hoof in the usual way, and it will, when seen on the under side, have the appearance of fig. 10, holding the rester as before described.

In a foot so prepared, any required degree of pressure may be obtained according to the padding, and from the absorbent quality of the stopping materials introduced into the hollow of the foot, the hoof will always be kept moist, from which the most beneficial results may be expected.

The back part of the artificial frog may be turned down, which will prevent slipping, and the frog, with its cross-piece, may be made in one, as fig. 10, or as fig. 11, but it is preferred to make it with a spring support, as fig. 9.

The specification concludes by saying, "although I have described the various forms or shapes of the several parts of my invention and apparatus, and the materials of which I conceive they are best made and constructed, yet as my invention does not consist in these alone, I do not confine myself to them, inasmuch as it may be necessary to vary them to suit any particular cases. The essence of my invention, and the only part of the same which I claim the sole and exclusive right and benefit of, under my aforesaid herein recited patent, is in the apparatus last above described; viz. the artificial frog of iron or other metal, with or without a spring, and the soft and elastic packing of sheep skin with the wool upon it, or other fit material as herein-before mentioned, and I therefore claim the use of all such materials as possess the requisite properties of retaining moisture and protecting and assisting the foot when used and applied in the manner above described, that is when used and nailed upon the foot in conjunction with the shoe as aforesaid."*

[*Inrolled, February*, 1824.]

To FRANCIS DEACON, *of Birmingham, in the County of Warwick, Wire-drawer, for an improved Method of manufacturing Furniture for, and an Improvement in the mounting of Umbrellas and Parasols.*

[Sealed 22nd April, 1823.]

THE object of the patentee in these improvements is to tender umbrellas and parasols light, and at the same time giving them sufficient strength; it is therefore proposed instead of the solid stick to which the frame-work is attached, and upon which it slides in ordinary umbrellas and parasols, to make the stick part hollow, either of a metal tube covered with calico or of *papiere mache*; the latter will admit of ornamental devices or patterns being formed upon it by the usual mode of making or working that substance. If the stick part be made of metal tube it is proposed to cover it with cloth or any fibrous material, and to varnish it and also the *papiere mache* thickly, which will prevent the wet from acting upon either the metal, so as to corrode it, or upon the paper composition, so as to cause it to fall to decay.

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* See Colman's Patent for Improved Horse-shoes, Vol. I. page 344, of this Journal.

It is also proposed to form the joints of the ribs by means of dove-tailed metal caps attached to the ends of the whalebone, cane, or other ribs, which dove-tailed ends are to fall into notches in a cup, and be confined there by a plate afterwards attached to cover the cup, by which means the dove-tailed ends will be prevented from coming out of the notches, and a series of joints without axles will be produced all round the head of the umbrella or parasol, which joints will be strong and not subject to corrode by wet.*

The joints of the runners and stretching rods are to be formed by turning the ends of the stretcher round at right angles, and passing the bent ends into an eye attached to the runner at one end and to the rib at the other; when so passed through the eye, the bent end is to be rivetted, for the purpose of keeping it from falling out. The end of the stretching rod may be varied in its form, as for instance, it may be made as a crutch-head, and then two eyes will be necessary to hold it, and several other slight variations are proposed, the object of which appears to be that of avoiding the wire usually passed through at the joint, which is very apt to corrode by the wet.

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* See Hobday's Patent for Improvements on Umbrellas and Parasols, Vol. IV. page 302.

[*Inrolled, October*, 1824.]

To John Rankin, *of New Bond Street, in the County of Middlesex, Esq. for his Invention of a Means of Securing valuable Property in Mail and other Stage Coaches, Travelling Carriages, Waggons, Caravans, and other similar public and private Vehicles, from Robbery.*

[Sealed, 1st November, 1823.]

The plan herein proposed for securing property when conveyed by a stage coach, is by attaching an alarm to the box seat, or boot of the coach, or any other part where the property is deposited, which alarm shall go off by the opening of the door, and strike a bell or give any other signal, which shall be sufficiently loud and distinct to give notice to the driver or guard, whom it is to be supposed will never be so far from the carriage as to be out of the reach of the report.

Various modes might be devised of adapting such a contrivance, but that particularly recommended by the patentee is to attach a broad flat bell to a partition on the inside of the box where the property is deposited, and to connect to the lock or latch of the box a lever, which whenever the door is opened shall raise a hammer that is held by a spring, the recoil of which causes it to strike the bell one sharp stroke, and this it is considered will give a sufficiently loud report to inform the coachman or guard or passengers that the box has been opened.

There is nothing peculiar or new in the mechanism, and there may be many modes devised of effecting the object, the invention therefore is to be considered as consisting simply in the adaptation of an alarm bell to the box, boot, or other depository of a mail coach, stage coach, private carriage, or waggon, which shall be discharged on opening the door.

[*Inrolled, December,* 1823.]

To Joseph Foot, *of Church Street, Spital Fields, in the County of Middlesex, Silk Manufacturer, for his Invention of an improved Umbrella.*

[Sealed, 15th January, 1824.]

The patentee states, " my invention consists in an umbrella stick or frame, covered with a fabric or manufacture of silk and cotton threads made into a sort of web, by shooting cotton or linen upon a silk warp, by which means the surfaces of the said fabric or manufacture shews more silk than cotton or linen." We do not exactly see what the umbrella stick or frame has to do with the invention, which if we understand it, is merely the appropriation of a peculiar kind of fabric to the covering of umbrellas, to which it is stated to be particularly suited, and which by this patent is, when applied to that purpose, exclusively claimed.

The advantages proposed are that the umbrella when so covered will be more light in the hand, and less pervious to the rain, than those umbrellas covered with silk or cotton now in use; and which fabric is, when so employed, more durable and less expensive than silk.

The frame of the umbrella is to be formed of the ordinary materials, and put together in the usual way; it is only the covering which must be of the fabric before mentioned, (viz.) cotton threads shot into a silk warp, and which as applied to the covering of umbrellas, is considered to be a new invention.

Inrolled, July, 1824.]

TO JEAN LE GRAND, *of Lemon Street, Goodman's Fields, in the County of Middlesex, Vinegar Manufacturer, in consequence of a Communication made to him by a certain Foreigner residing abroad, and discoveries by himself, for certain Improvements in Fermented Liquors, and the various Products to be obtained therefrom ; the same being new in this Kingdom.*

[Sealed, 15th January, 1824.]

IN order to give those wines and vinegars which are not obtained from grapes the qualities which distinguish those that are made from grapes, it is proposed to employ tartaric acid, citric acid, and oxalic acid, which are to be introduced into the fermented worts, wash, or liquors, either before or after, or during the time that the acetous fermentation is going on. These acids may be employed either in their crystallized state, or dissolved and diluted with water.

These acids are also to be mixed together or introduced separately into all sorts of spirituous liquors, either in a pure or diluted state, for the purpose of converting those spiritous liquors by acidification into vinegar, similar to that made from the wine of grapes; or by distillation or rectification, to convert them into brandy of the kind obtained from grapes.

The same vegetable acids are likewise to be employed by mixing one or more of them with the acetic acid, or any kind of vinegar, to increase the strength of those liquids, or to impart to them the qualities of the vinegars obtained from grapes or other fruit.

[*Inrolled, July*, 1824.]

To JOHN CHRISTIE, *of Mark Lane, in the City of London, Merchant, and* THOMAS HARPER *of Tamworth, in the County of Stafford, Merchant, for the Invention of an Improved Method of Combining and Using Fuel in Stoves, Furnaces, Boilers, and Steam Engines.*

[Sealed, 9th October, 1823.]

THIS improvement is, the mixing of small bituminous coal with culm or coal dust, which after being completely blended together, is to be placed in a coke oven, and converted into coke in the usual way. The proportions are indefinite, depending upon the qualities of the coal and of the culm; the object being economy, the smaller the quantity of coal used the greater will be the saving.

Culm is frequently found in pits by itself, in a pulverised state, or mixed with coal in different proportions, but sometimes is in large lumps, which must be broken to be incorporated with the small bituminous coal, previous to being caked together in the coke oven. About equal quantities of each are generally used, but this must always depend as before said upon the qualities of the two articles.

When formed into cakes of coke, these cakes may be used for fueling furnaces, heating stoves, boilers of steam engines, and other fire-places, with very considerable advantage and economy.

[*Inrolled, December*, 1823.]

Original Communications.

To the Editor of the London Journal of Arts.

SIR,

PERMIT me to solicit a place for the following project in your Journal of Arts, which is designed to obviate some of the inconveniences attendant upon the present mode of attaching shutters to shop windows. The annoyance, and sometimes serious injury, experienced by pedestrians in passing along the streets at the time that shops are opened or closed, cannot have escaped the notice of those who are the least alive to public inconvenience, I have therefore proposed a mode by which the window shutters may be always under the control of persons within the shop, who could at any time close the shutters, or a part of them, without obstructing the passers by, or being themselves exposed in bad weather; this plan in populous places would also be found desirable, as in the event of any sudden tumult in the street the shop might be instantly closed, without entering the crowd to raise the shutters as in the ordinary way, which it is sometimes under those circumstances impossible to do; the plan also affords a greater security against burglary, the whole of the shutters being composed of metal, from which circumstance an entry by removing one of them could not be effected.

Plate VI. fig. 13, shews the outside of a window, to which the shutters are adapted upon the improved principle. Fig. 14, is a section of the window and of the shutters, shewing the mode by which they are attached and connected together. The shutters are placed horizontally, as *a a a*, and consist of long metal plates, (sheet iron is proposed) the upper and lower edges of each plate being bent over, as shewn at fig. 15. To the extremities of the upper shutter chains are attached, which pass over rollers at the top corners of the window-frame; these chains both come down to a barrel placed in a box on the side of the window within. This barrel and the apparatus connected with it is shewn detached at fig. 16 and 17.

In order to close the shutters a person within the shop turns the winch *z*, which by means of the endless screw *y* taking into the toothed-wheel *x*, causes the barrel *w* to turn, and in turning to coil the chains *u*, which are attached to it. These chains, as before said, pass over rollers at the top corners of the window, one of the chains descending again and taking hold of the upper edge of the shutter on that side next the barrel, the other chain passing along the top of the window and over a roller at the corner, then down on the other side to the edge of the shutter, to which it is attached. By these means the upper plate or shutter is suspended by the chains, and is drawn up by turning the winch in the manner described. The several shutters or horizontal plates slide up and down in vertical grooves formed in the sides of the window frame, and are attached together by the folding edges shewn at fig. 15, hence the lifting of the top shutter will bring up the lower ones in succession, until the whole are raised and the window is completely closed in.

In opening the window again, that is causing the shutters to descend, it is only necessary to turn the winch in a contrary direction, so as to uncoil the chains, and the weight of the shutters will cause them to descend perpendicularly and fall into the box or space under the window-ledge provided for that purpose, the top shutter having a brass edge or bead, which laps over the others and encloses the whole from observation. The side perpendicular chains are also enclosed behind the window-frame, and the external appearance of the whole, when the window is open, will be in no respect different from that of ordinary shop-windows. The frame of the window would afford a strong and permanent support to the superincumbent brickwork; and the small quantity of rain water that would be admitted at the grooves and sides, might be carried off by a pipe at the bottom of the box which receives the shutters; care being taken that the pipe should be so placed as not to be affected by frost.

This is my plan for the shutters of shop-windows particularly, and if you think it worth a place in your journal, by giving it insertion you will oblige,

Sir

Your most obedient Servant,

J. CERCOVE.

George Street, June, 1824.

To the Editor of the London Journal of Arts.

SIR,

IT is a circumstance very much to be regretted, that the enormous and unequalled power obtained by the hydrostatic paradox or Bramah's press should be so very much confined in its application, or rather, that it should meet with so little regard. The steam-engine alone engrosses every one's attention, while scarcely an individual has endeavoured either to extend the utility of, or in any way to improve upon, this highly valuable and astonishing machine. Yet are there very many and obvious instances in which it may be employed to great advantage. Where a great weight is required to be raised to a definite height, as in cranes, &c. it clearly may be used in its most simple form, with very peculiar advantage, and which as I think the following calculation will sufficiently demonstrate:—

(See Plate VI. fig. 18.)

Let the diameter of the cylinder A. be	12 in.	Power of the press will be 2304.
Of injection B - - -	¼ in.	
Power applied - - -	unity	
Then let diameter of pinion C	4 in.	This combination gives for one ascent of the piston-rod 27 revolutions of the drum=84 feet, and diminishes the power to $\frac{2304}{27}$ 85
——— wheel D	36 in.	
——— pinion E	4 in.	
——— drum F	12 in.	
Length of piston-rod *m*, or altitude of cylinder A	36 in.	

Now supposing the diameter of the forcing pump two inches, and length of its stroke six inches, the cubic content will be 18.8, and the content of the cylinder (twelve inches diameter, and thirty-six inches alt.) being 4071.5 inches; the number of strokes required to raise the piston through thirty-six inches, that is, to fill the cylinder A, will be $\frac{4071.5}{18.8}$=216; further supposing the lever by which the pump is worked to have a power of six to one, the longest arm will at each stroke describe an are of three feet, and consequently in two hundred and sixteen strokes it will have passed through 648 feet: 1 through 648 feet will lift (85×6) 510 through 84 feet, or 1 through 8 feet, will lift 510 through 1 foot, a result very far superior to any of the cranes now used; for their greatest extent I believe (where horse-power is not employed) is 1 through 12 feet lifts 24 through 1 foot.

In addition to this extraordinary gain of both time and power, are some minor peculiarities no less deserving of attention. Its great *simplicity* of construction (I am not competent to speak to the *economy*) combines all the advantages of the far more complicated machines for the same purpose. The friction-wheel and band used to regulate the descent of heavy goods, is supplied by the cock by which the water is drawn off from the cylinder A, for by opening this more or less the velocity may be regulated to the greatest nicety. The ratchet-wheel of the common crane may be dispensed with, and its dangers annihilated, for it is self-apparent that the working of the engine may be left off at any stage in the greatest safety; and add to this, that the strength of a man is much more efficiently exerted at the pump-handle than at the winch.

I fear that in point of expence it might be found to exceed the generality of cranes, for *two pumps* would be requisite to produce a continuous motion, but where a machine occupying a little space is required to raise great weight to any considerable height in little time, as in lofty warehouses, &c. I certainly conceive this would be found of considerable advantage.

In pile engines, where the weight of the ram is but trifling, and where a gain of *time* is a valuable consideration, it seems admirably adapted; for very few strokes of the pump, with *two men* in lieu of *four*, would produce an effect many times the multiple of the ordinary engines.

Possessing but an indifferent portion of theoretic skill, and boasting no knowledge beyond what my study affords, I may not have been very judicious in my choice of the foregoing combinations, having selected those which produced the neatest results upon paper, and perhaps even the calculations themselves may be at variance with practice, and I much fear this may be the case, or so simple an affair could scarcely have so long lain dormant; however, I take the liberty of submitting it to your inspection, with a view to its obtaining publicity in your most useful Journal, should it prove free from objection.

I am, Sir, Yours, &c.

14*th July*, 1824. GORDON D. BROWNE.

To the Editor of the London Journal of Arts.

SIR,

In the last Number of your Journal, page 84, I find a letter which I presume Mr. White considers to be a very trite and pithy reply to my remarks upon one of the projects in his "Century of Inventions," which he has designated with the name of an *Hydraulic Lamp* for the table. With all the additional light of Mr. White's comments, I am still disposed to observe that his said to be lamp, is no lamp at all. Mr. W. says, "to avoid the fatigue of thought, I have consulted an awkward experiment:" if he refers to my letter he will find that reflection led me to the fallacy of his scheme, which I subsequently proved, as I think, to a demonstration.

Mr. W. says "I have chosen a part of his work intended to elucidate a principle, and conjured it into a lamp:" admitting the first part of the assertion, I have chosen his principle, and find it a faulty one; which of us is the *conjurer* is yet to be proved; he has certainly entitled this principle an hydraulic lamp for the table, and if I mistake not, it will be found that I have quoted the whole of the descriptive part of the principle upon which the lamp is to be constructed, and Mr. W. merely follows the description by saying "I have given this idea what I think a better *form* in fig. 6," evidently intending to continue the same principle, which I say, according to the explanation given, is founded in error.

But without proceeding to prolixity, if Mr. W——'s project will answer for a lamp, it will be an extremely valuable one, and I shall be ready any time to retract and acknowledge my error; but before I can prevail upon myself to do so I must have the most unequivocal proof, no less than the lamp itself; and in order to enable Mr. W. to prove his assertion, I hereby pledge myself to pay for a lamp constructed upon the principle he has set forth as soon as he produces one, ***having the usual size argand burner, the flame to be half an inch high, and to burn six hours without being touched.***

This proposal will surely "satisfy the lover of truth and secure the ends of justice." And as I wish the proof to be made as public as possible, I request that you, Mr. Editor, will be good enough to receive the said lamp, if produced; and indeed, if Mr. W. will inform you what will be its probable cost, I will deposit the amount in your hands, to be paid upon the fulfilment of the conditions.

In conclusion, I would respectfully hint to Mr. W. that it would have been more consonant with the professions of a philosopher, if he had confined himself to the subject under discussion, and not have given vent to abuse.

I am, Sir,
Yours respectfully,
W. D.

Strand, Aug. 26, 1824.

Novel Inventions.

Improved Mode of Fulling Cloth.

MESSRS. Northrup and Dillon, of New Jersey, North America, have proposed a method of fulling cloth without employing soap or any other alkaline matter, and without steam, in a much shorter time, and in a more perfect manner than has been heretofore accomplished; their process is described as follows:—

After the oil has been removed from the cloth it is to be dried. A composition is then made of rye flour and pure water, in the proportion of four quarts of the flour to eight gallons of water, which is to be boiled to the consistency of a thin paste, or the flour may be mixed in hot water. The cloth is then to be made sufficiently wet with the paste (which may be applied either warm or cold) and put into the same kind of fulling mills, and beat about as is customary when soap or steam is used. When the cloth has been sufficiently fulled in this manner, the paste is to be washed out or scoured with pure water.

In the same manner a thin paste, made of wheat oats or barley flour, may be employed, and other vegetable substances of a similar nature may be used in the process of fulling with great advantage: the employment of vegetable matters instead of animal matter in the process of fulling being the substance of the invention.

By using these materials the cloth becomes fulled to a proper thickness in a much shorter time than with soap; is softer, firmer, and less worn in the mill, costs one-fifth the expence of fulling with soap;* and retains the colour of indigo blues and all other colours that are dyed before fulling, in greater perfection than when soap is employed.

Spring Waggons.

A project by which waggons may be rendered easy for the conveyance of sick persons, or wounded soldiers, has been published in an American periodical as the invention of a Mr. Blair, of New Haven, Connecticut. The plan is to place a series of spiral springs in the bottom of an ordinary waggon, and lay a false bottom upon these springs, which false bottom shall be thereby enabled to rise and fall as the waggon passes over irregular parts of the road.

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* This may be the case in America: query, will it be so in this country? Corn of every kind is there cheap, and in abundance, here it is always an expensive article.

It is proposed that the spiral springs shall be made in the shape of hour-glasses, the lower part of the springs being fastened to the ordinary bottom of the waggon; the false bottom is then to be placed upon these springs, corresponding of course with the shape of the waggon, and attached by any suitable contrivance to the tops of the springs on which it rests.

It is stated that the movement of the false bottom upon the springs may be regulated by bolts or pins of wood, or metal, connecting it with the real bottom in such a manner that these pins may be permitted to play freely up and down through the real bottom; and to the ends of these bolts or pins under the fixed bottom a screw and nut may be attached, or pins passed through them so as to regulate the action in any manner desired.

If these spring waggons are constructed solely for the purpose of conveying invalids or wounded soldiers, the fixed bottoms may be dispensed with, as they are mentioned only under the consideration of adapting ordinary waggons to the purpose. In that case the springs may be attached to the axle-trees, or on beams passing from one axletree to another, and then the whole of the vehicle will ride upon these springs.

The first part of this project may have some novelty in it, though its practical usefulness is to us extremely doubtful, but in what respect the second plan differs from other spring carriages (except perhaps in the form of the spring) we do not perceive,

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M. Braconnot's Process for making the Schweinfurt Green Dye.

THIS green dye, which has acquired great reputation, and the secret of making which was known only to a manufacturer at Schweinfurt, has been analyzed by M. H. Bracconnot. He found it to consist of arsenical acid, deutoxide of hydrated copper, and acetic acid; thus approaching, in its ingredients, to Scheele's Green. After much difficulty, he succeeded in finding the following method of re-combining these materials:—

1. Dissolve *six* parts of sulphate of copper in a small quantity of warm water.

2. Boil *eight* parts of sulphate of potash of commerce with *eight* parts of oxide of arsenic, till carbonic acid ceases to be disengaged.

3. Mix this solution, while hot and concentrated, with the former by a little at a time, continually stirring it till the efflorescence ceases. Care must be taken not to add the second solution, viz. the arseniate of potash, in excess. An abundant precipitate is formed of a dirty yellow colour.

4. Add about *three* parts of acetic acid, or such a quantity of it that there may be a slight excess of it sensible by its odour after the mixture. By degrees the precipitate diminishes in volume, and at the end of a few hours there is spontaneously deposited a powder of a slightly crystalline texture, and of a very beautiful green.

5. Separate the supernatant liquor, (which, by remaining too long on the colour, might deposit oxide of ar-

senic, which would render it pale,) and then treat the coloured deposite with a large quantity of boiling water, to remove the last portions of arsenic which are not held in combination.

Bracconnot recommends the use of an arsenite of potash, well saturated with arsenic. Part of the arsenious acid remains in the mother waters, but this may serve for the preparation of Scheele's Green, which is commonly used for paper of an inferior colour. Bracconnot was of opinion that the addition of a small quantity of Scheele's Green to the mixture promoted the production of the superior quality. The colours produced by the preceding process of Bracconnot were regarded by several persons to be more lively than that of Schweinfurt.

Dr. Liebig's Cheap Process of making the Schweinfurt Green.

On account of the tediousness and expense of the preceding process of Bracconnot, Dr. Liebig has given the following as a preferable one, in the *Annales de Chimie*, for August, 1823.

Dissolve in a copper kettle, by heat, *one* part of verdigris, in a sufficient quantity of pure vinegar, and add to it an aqueous solution of one part of white arsenic. A precipitate of dirty green generally forms, which must be renewed by adding more vinegar, or till the precipitate is perfectly dissolved. After boiling this mixture, a granular precipitate will in a short time form, of the most beautiful green colour, which, being separated from the liquid, and well washed and dried, is the required colour. If the liquor, after this, contains copper, more arsenic may be added; and if it contains an excess of arsenic, more copper may be added, and the process repeated.

When the liquid contains an excess of acetic acid, it may be employed in dissolving more verdigris.

The green prepared in this way has a bluish shade; but the arts often require a deeper shade, somewhat yellowish, but of the same beauty and elegance. To produce this, dissolve a pound of common potash in a sufficient quantity of water, and having added to it ten pounds of the colour prepared as above, warm the whole over a moderate fire. The mass will soon acquire the required shade. If it is boiled too long, the colour will approach to Scheele's green; but it always surpasses it in beauty and splendour. The remaining alkaline fluid may be used in the preparation of Scheele's Green.

Brewster's Edin. Jour.

Bevan's Experiments on the Adhesion of Nails.

In order to determine the force with which nails adhere to wood, in which they are driven, Mr. B. Bevan constructed a machine for measuring the force of tension with extensive power. He applied it to the extraction of nails of different lengths, from a quarter of an inch to two and a half inches.

The following were the results obtained by Mr. Bevan, when the nails were forced into dry Christiana deal, at right angles to the grain of the wood.

Kind of Nail.	Number to the lb. avoird.	Inches in length.	Inches driven into the wood.	Pounds required to extract them.
Fine sprigs . .	4560	0.44	0.40	22
Ditto . .	3200	0.53	0.44	37
Threepenny brads	618	1.25	0.50	58
Cast iron nails .	380	1.00	0.50	72
Sixpenny nails .	73	2.50	1.00	187
Ditto . .	——	——	1.50	327
Ditto . .	——	——	2.00	530
Fivepenny . .	139	2.00	1.50	320

He likewise found, that the progressive depths to which a sixpenny nail was forced into dry Christiana deal, by simple pressure, were as follows:—

A quarter of an inch . .	24 lbs.
Half an inch . . .	76
One inch . . .	235
One and a half inch . .	400
Two inches . . .	610

Philosophical Magazine.

On the Revival of the Inscriptions on Coins and Medals by Unequal Oxidation.

It has been long known, though we have not been able to ascertain to whom we owe the discovery, that a coin, from which the inscription and the figures have been entirely effaced, so as not to present the slightest trace of an impression, may have the inscription and figure partly or wholly restored, by placing it upon a hot iron. In order to perform this experiment with the fullest effect, the coin employed should be one equally worn down, and in which very little of the metal has been worn off the hollow parts by which the letters are surrounded.

When a coin of this kind, or what is still better, a coin on which an illegible trace of the letter still remains, is placed upon a heated iron, it will be seen that an oxidation takes place over its whole surface, the film of oxide changing its tint with the intensity or continuance of the heat. The parts, however, where the letters of the inscription had existed, oxidate at a different rate from the surrounding parts, so that these letters exhibit their shape and become legible in consequence of the film of oxide which covers them having a different thickness, and therefore reflecting a different tint from that of the parts adjacent. The tints thus developed sometimes pass through many orders of brilliant colours, particularly pink and green, and settle in a bronze and sometimes a black tint, resting upon the inscription alone. In some cases the tint left on the trace of the letters is so very faint, that it can just be seen, and may be entirely removed by a slight friction of the finger.

When the experiment is often repeated with the same coin, and the oxidation successively removed after each experiment, the film of oxide continues to diminish, and at last ceases to make its appearance. It recovers the property, however, in the course of time. When the coin is first placed upon the heated iron, and consequently, when the oxidation is the greatest, a considerable smoke rises from the coin, and diminishes like the film of oxide by frequent repetition. A coin which had ceased to give out this smoke, smoked slightly after twelve hours exposure to the air, having been removed from the hot iron at the beginning of that interval, and replaced upon it at the end of it by a pair of pincers.

From a great number of experiments, I have found that it is always the raised parts of the coin, and in modern coins the elevated ledge round the inscription that oxidate first. This ledge, in an English shilling of 1816, began by exhibiting a brilliant yellow tint before it appeared on any other part of the coin.

In examining a number of old coins, a brilliant red globule, accompanied with a smell of sulphur, appeared on one or two points of the coin; and sometimes small globules, like those of quicksilver, exuded from the surface. Other coins exhaled a most intolerable smell; and an Indian Pagoda became perfectly black when placed upon the heated iron.

Such being the general facts respecting the oxidation of coins, it becomes an interesting inquiry to determine its cause. If we take a homogéneous and uniform piece of silver, and place it upon a heated iron, its surface will oxidate equally, if all the parts of it are exposed to the same degree of heat. A coin, however, differs from a piece of silver of uniform texture, as it has been struck with great force during the act of coining. In this process the sunk parts have obviously been most compressed, by the prominent parts of the die, and the elevated parts least compressed, the metal being left as it were in its natural condition. A coin, therefore, is a piece of metal in which the raised letters and figures have less density than the other parts, and consequently these parts oxidate sooner or at a lower temperature. When the letters themselves are rubbed off by use, the parts immediately below them have also less density than the metal which surrounds them, and consequently, they receive from heat an oxidation and a colour different from that of the surrounding surface. Hence, the reason is obvious, the invisible letters are revived by oxidation.

A similar effect takes place in the beautiful oxidations which are produced on a surface of polished steel. When the steel has hard portions, called *pins* by the workmen, the uniform tint of the oxide stops near these points, which always display colours different from the rest of the mass.

The smoking of the coin, the diminution of its oxidating power, by a repetition of the experiment, and the recovery of that power by time, seem to indicate that the softer parts of the metal absorb something from the atmosphere which promotes oxidation. Whether this is oxygen or not remains to be determined.

Brewster's Edin. Jour.

Polytechnic and Scientific Intelligence.

Royal Society of Edinburgh.

April 5, 1824.—A paper by Dr. Edward Turner, was read, entitled, "On the Application of Professor Dobereiner's Discovery to Eudiometry."

On the same evening a paper by George Anderson, Esq. was read, "On the Quartz District in the neighbourhood of Loch Ness."

April 19.—A paper by Dr. Brewster was read, "On the Optical and Mechanical Structure of the Minerals which form the Composite System, which it is proposed to add to the other System of Crystallography."

Professor Mohs having arranged minerals under four systems, viz.—

1. The Rhomboidal System.
2. The Pyramidal System.
3. The Prismatic System.
4. The Tessular System.

The author of this paper proposes to add the *Composite System*, as marking by a simple and unequivocal name, the general character of the structures of the minerals which it comprehends.

The Composite minerals divide themselves into two classes, viz.—

Class I. Those in which the physical properties of the individual crystals are *not altered by the combination;* and

Class II. Those in which the physical properties of the individual crystals *are altered by the combination.*

Both classes are subdivided into two orders:—I. Those crystals which are found separately in nature; and II. Those which are not found separately in nature; and these are again subdivided into Sections.

As most of the structures described in this paper are entirely new, and require to be illustrated by figures, we are not able at present to give any further account of them.

May 3.—The following gentlemen were elected ordinary members of the Society:—

William Wood, Esq. President of the Royal College of Surgeons.

Dr. William Crosby Mair, Physician of the Embassy to Mexico.

Dr. Turner's paper was concluded at this meeting.

May 17.—A paper by Dr. Brewster was read, entitled "A Description of two filamentous Surfaces of Quartz incapable of reflecting Light."

There was laid before the Society a Memoir, by Professor Moll, of Utrecht, and M. Von Beck, on the Velocity of Sound.

Wernerian Society of Natural History,
1824.

March 19.—There was read at this Meeting an account of a new British species of Spatagus, and also of a new species of Plumularia, brought home by Capt. Parry, by the Rev. Dr. Fleming, of Flisk.

Observations, by P. J. Selby, Esq. were also read, on the natural history of the Golden Crested Regulus, and notices on the management of young plantations, by Mr. F. C. Parry.

April 3.—Dr. Knox read his remarks on the supposed discoveries of Professor Tiedemann, on the distribution of the lacteal vessels in the *Phoca vitulina, &c.*

April 17.—A paper by Dr. Knox was read, in which he gave an account of his discovery of the presence of a dark-coloured *periosteum,* investing nearly all the bones of the *Colymbus septentrionalis.* This singular appearance has been observed in very few birds, and these have belonged to genera very distinct from the Colymbus.

A colossal species of sponge was exhibited, said to be from the Indian sea. It does not appear that any description was given of this sponge, which may or may not be a particular species. There were even doubts raised, (after the meeting of the Society had closed,) whether the substance in question was really a sponge or not. As no opportunity had occurred of examining it carefully, no member ventured to offer an opinion on the subject. It seemed to be a sponge, and of a form not unlike what has occasionally been seen. In the very philosophic work of Grew, on "The Anatomy of Guts and Stomachs," there is a drawing much resembling this colossal sponge.

April 28.—A Memoir on the Sand Hills in the vicinity of Edinburgh was read.

A specimen of the native dog of New Holland, and another of a dog from Greenland, were exhibited to the Society.

May 12- A paper by Henry Witham, Esq. was read, On the Peculiarities in the Trap Rocks in the counties of York, Durham, Westmoreland, and Northumberland. Also, a notice by Robert Stevenson, Esq. on the pernicious effects on Fruit Trees, of thin layers of Bog Iron Ore immediately under the surface soil in Aberdeenshire. Mr. Deuchar likewise read a notice on the Theories of Galvanism.

Cambridge Philosophical Society, 1824.

March 1.—J. Okes, Esq. honorary member of the Cambridge Philosophical Society; read a notice of a considerable number of fossil bones of the elephant, rhinoceros, buffalo, deer, horse, &c. found near Barnwell, Cambridgeshire, in a sandy gravel, intermixed with bleached specimens of several species of land and fresh water shells, indigenous to Cambridgeshire.

Rev. W. Mandell, B. D. Queen's College, read an unedited letter of Sir Isaac Newton to Mr. Aclaw of Geneva.—Rev. Professor Sedgwick, M.A. Trinity College, read a communication containing some additional observations on the geology of Teesdale, made during the year 1823.

March 15.—Rev. W. Mandell, B.D. Queen's College, gave a description of a self-regulating lamp.

G. B. Airy, B.A. Trinity College, read a communication on the figure of equilibrium of a fluid disturbed by small forces. The form assumed by the fluid was found, from an investigation on simple principles, conducted with reference in particular to the figure of Saturn as affected by the action of his ring; and it was shown, that the peculiarity of Saturn's form observed by Sir W. Herschel, cannot arise from this attraction.—Professor Sedgwick continued the reading of his supplemental observations on the geology of Teesdale.

March 29.—Rev. W. Mandell, B.D. Queen's College, exhibited a mode for defending locks from the insertion of skeleton keys.

A communication was read from G. Hervey, Esq. F.R S.E, M.G.S. &c. "On the Fogs of the Polar Seas."

Mr. Harvey, assuming the principle laid down by Dr. Hutton, "that the production of fog or mist arises from the admixture of volumes of air of unequal temperature, and holding water in solution," explains the [prevalence of dense fogs in the Arctic seas during the summer months, by supposing that the air which surrounds the different icebergs is kept at a lower degree of temperature than the air which reposes on those portions of the ocean that are free from ice. Whenever, therefore, this cooler air intermixes with the warmer, fog will be the result, varying in density according to the modifying causes which may chance to operate.

Professor Sedgwick concluded his supplemental observations on the geology of Teesdale.

Royal Academy of Sciences of Paris, 1824.

March 1.—THE Minister of the Marine transmitted some specimens of the coal which had spontaneously taken fire in the arsenal of Brest. He solicited the academy to investigate the cause of the phenomenon.—M. Paulet presented his manuscript translation of the history of Plants by Theophrastus.—M. Cuvier read a Memoir entitled "A new Examination of a Fossil Animal from the Schists of Solenhoffer, which appears to belong to the Class of Reptiles, and to which the Name of Plerodactylus has been given."—M. Jomard read a note on the discoveries recently made in Africa.—M. Becquerel read a Memoir on the Magnetic Actions produced in all Bodies by the Influence of very powerful electric Currents.—M. Paixhaus gave an account of the experiments lately made at Brest on his new system of artillery.—M. Fresnel, in the name of a Commission, made a Report on an Improvement of Saussure's Hygrometer proposed by M. Babinet.

March 8.—M. Bulle, of Besancon, transmitted a manuscript Memoir, entitled *Système rotatif rayonnant.*—M. Bussy described the means he had employed for the liquefaction of sulphurous acid gas.—Mademoiselle S. Germain presented a Memoir, in manuscript, on the Effects which the variable thickness of sonorous Plates produces on their Vibrations.—M. Pouillot presented an Essay on the Oscillations of the Waters of the Ocean.—M. Poncelet, Captain of Engineers, presented a manuscript work, entitled "On the Centres of harmonic Means," supplementary to his Treatise on the projective Properties of Figures.—M. Desfontaines made a very favourable Report on the Memoir of M. Auguste Saint-Hilaire, entitled "A Monograph of the Genera *Sauvàgesia and Levradia.*"—M. Moreau de Jonnes read some New Researches on the *Trigonocephalus fer de Lance*, or great Viper of the Antilles.—M. Cagniard de la Tour deposited a manuscript Account of his new Researches on Carbonic Acid Gas, and the other aeriform Substances which he has obtained in a liquid state. He exhibited several products of his experiments.—M. Dulong in the name of a Commission, made a Report on the Method of measuring the Power of Bodies to conduct Electricity proposed by M. Rousseau.

March 15.—M. Payen transmitted an Analysis of Tupinamba Root.—M. Bussy announced that the means by which he had succeeded in liquefying sulphurous acid gas, had also enabled him to liquefy chlorine, cyanogen and ammonia—M. Moreau de Jonnes exhibited the young in the state immediately prior to birth of the *Trigonoce-*

phalus fer de Lance.—M. Fresnel, in the name of a commission, made a Report upon an instrument which M. Thilonier had originally designed for the fabrication of mirrors for telescopes, but which he had also applied to the formation of the parabolic and elliptic mirrors of copper employed in experimental philosophy: in this respect the Memoir appeared worthy the approbation of the academy.—M. Geoffrey Saint-Hilaire read a Memoir on the Osseous System, as affording the most certain indications of zoological affinities, and on the presumed causes of its superiority in that respect.—M. Latreille read an extract from his Memoir on the Geography of central Africa.—M. Mongez commenced reading a memoir on the Trees called by the Romans *Citrus* and *Citrum*.—M. le Baron Blias read his Researches on the Theory of Sound and of Vibrations.

March 22.—The Minister of the Interior communicated to the Academy a Report by the Sub-Prefect of Embrun, containing Observations made during a journey to Chamouni.—M. Magendie communicated the results of his experiments on the sense of smell. He announced that this sense is not entirely destroyed by the division of the olfactory nerve: he described also the various effects which result from the division of the fifth pair of nerves.—M. Freycinet read a letter from M. Duperry, dated Otaheite, in which that officer announced the discovery of four new islands near the Perilous Archipelago.—M. Percy made a Report on a new Method of destroying the Stone in the Bladder, proposed by Dr. Civiale.—M. Gay-Lussac read for himself and Dr. Liebig, a Memoir on the Fulminate of Silver.—M. Serulas, pharmaceutic chemist, read a Memoir on a new Compound of Iodine, Azote, and Carbon.

March 29.—A Note by M. Becquerel was read, in which he explained in what manner, by means of an extremely sensible apparatus, he had succeeded in determining the electro-motive actions which take place at the moment when acid and alkaline solutions come into contact with any metal; and likewise those which take place when a liquid is interposed between two metals.—M. Mongez concluded the reading of his Memoir on the *Citrus* of the Romans.—M. Fouilhoux read a Memoir entitled "Anatomical and Physiological Remarks on the Ganglionic System."—An abridged Analysis of a Memoir, by M. Roche, on the Rotatory Motion of Solid Bodies, was presented to the Academy.—M. Poinsot mentioned that he had completed a work which contained several theorems recently announced by him.

The Academy concluded this sitting by going into a secret Committee for several objects of internal administration, and in particular for the consideration of *some arrangements necessary to expedite the publication of their Memoirs.*

April 5.—M. James Leroy claimed the priority of invention of the instrument above-mentioned, for effecting the destruction of stones in the bladder.—M. Séligne presented an achromatic microscope of his invention, which was referred to a commission.—M. de Humboldt gave some new information of MM. Boussingault, and Mariand de Rivero, who continue to explore the environs of Bogota with equal zeal and success.

Merchant Seamen's Institution.

In one of our preceding volumes, we mentioned a society which was projected for the better regulation of merchants' seamen. This institution though promising very many advantages both to science and trade, does not appear to have yet met with patronage in that quarter from whence a plan of such national importance should emanate. The insular situation of Great Britain, and its extensive commerce appears to demand some permanent mode of uniting the seamen of her merchant service, of encouraging their enterprize, of promoting them according to their abibities, and of attaching them to their mother country. The plans proposed by Mr. Dennis, which have been very extensively circulated, appear to embrace this object in an eminent degree.

The design is to form the seamen into a society, and to equip all merchant ships therefrom with officers, petty officers, and men, rising in their different stages according to their proficiency in scientific knowledge and practical seamanship. The want of such a regulation has often been productive of the most lamentable consequences, and the loss of lives and property, from the unskilfulness of persons who through interest or accident have had the command of vessels, has much too often obtruded itself upon our notice.

A case in point, selected from many others, presents itself to our recollection, which is set forth in the following notice from Lloyd's List, 10th of October, 1823.

"Batavia, Island of Java, 31st of May, 1823.

"The Transit Whaler, of Bristol, Dickson, acting master, arrived here on the 14th instant, in charge of a military guard, from Amboyna; at which place she had touched for the purpose of settling disputes, which had arisen among the crew, subsequent to the death of Mr. Alexander, the Master, who was killed by a whale, near Christmas Island. *Neither* THE MATE, *nor any of the crew being competent* to take charge of the Transit, Captain J.

Coffin, who was then at this place, has been appointed to the command of her, and will sail without delay ! ! "

From this and similar statements, it appears to be absolutely necessary that the merchant sea service should be managed differently, by which a recurrence of such palpable incompetence may be avoided, more especially as foreign states are inviting the best of our seamen into their service; which invitations are gladly accepted from want of encouragement here.

We understand that Mr. Dennis's plan has obtained between two and three thousand signatures of approval from persons best qualified to appreciate its merits, and we strenuously recommend it to the consideration of ship-owners, and indeed to the government, as a most important subject, which it appears to us will be productive of many benefits in a national point of view, beyond those which it has for its immediate object.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c. continued from Page 109.

Mr. John Martineau, (continued) On being asked his opinion as to the effect of the laws against the combination of workmen, so far as it prohibited them from combining to raise wages, or regulate the hours of working. Mr. M. stated that he could not form an opinion upon his own experience, because workmen of the class which he employed were not liable to enter into such combinations, they being generally paid according to their abilities, and the qualities of their work; but the opinion he had formed upon the subject from general observation, was that the combination laws had exactly a contrary effect to that which was intended.

The combinations have usually taken place in those trades where so much is paid for so many hours labour, without respect to the merits of the work produced as in the weaving branches. It is probable, that if no such laws existed, the wages would be lower, there would be more cordiality between the workmen and masters, and a competition would arise, that would have a tendency to reduce the price of labour. It is probable, that the effect of removing the law would be, that wages would rise and fall according to the demand and supply.

The masters frequently combine to regulate the price of wages, and the hours of working, and thereby compel the men to do so in their own defence. A combination of masters has recently taken place in Staffordshire, to raise the price of iron in the London markets, which will have the effect of diminishing the consumption of that article, and ultimately affect the workmen whom they employ. The same thing is about to take place in Yorkshire.

The laws against combinations tend greatly to disturb the harmony which should subsist between the masters and workmen, as the men consider those laws more oppressive than they really are, there is, therefore, a bond of union among the men which produces a constant action and reaction, and continual disagreements between them and their masters, both parties being unreasonable in their demands. The men generally succeed, but if they obtain a larger amount of wages than is reasonable, they soon underwork each other, and this, as well as other circumstances, tend to bring the wages down again to a reasonable rate. The laws prevent wages being raised and lowered according to the demand of goods. Masters frequently combine to fix the price of labour, and determinately withstand any advance, in which cases they generally succeed, as it is much easier for the master to combine and evade the laws than the men.

No evil is to be apprehended from the repeal of the combination laws, on the contrary, it would in the course of time, remove the evils brought on by those laws, but it would require great care on the part of the masters to remove the bad feelings the laws have produced. One effect arising from the men succeeding in their combinations against the masters, is to limit the number of apprentices which shall be taken. This inconvenience would probably no longer exist, if the masters and men were left to settle their own contracts: the hours of working and the amount of wages should be left perfectly open.

The prosecutions which have taken place under the existing laws, have been sometimes for refusing to fulfil engagements, mostly for combining to raise wages; if a man refuses to finish his work, he may be committed to prison and flogged, but this law is not politic. No good workman would be inclined to leave his work unfinished in a well regulated manufactory, and if he was so disposed, the sooner he was gone the better. It would be a good plan to prevent disputes, to commit agreements to writing, or to hang them up as rules, which is the case in some manufactories, and these rules should be determined upon entirely by the masters and the men, without the interference of the Legislature.

A man at Liverpool, was recently sentenced to twelve months imprisonment, under the combination laws, and a short time since, another man was murdered in the streets of Liverpool, for refusing to join a combination. This shews the inefficacy of punishment under the combination laws, and there is no doubt but that the severity of the punishment in the first instance, produced the latter catastrophe. The combination among shipwrights and sawyers at Liverpool, are frequently attended with very serious consequences, in no other part of the Kingdom are the combinations so strict and close; the effects of combinations there, have generally been that the masters were compelled to submit to the dominion of the men. If the combination laws were repealed, it is probable, that by judicious conduct in the masters, these evils would in time die away.

Owing to the long existence of these combination laws, funds have been created, upon which the men subsist when they have struck for wages, the first effects of repealing the laws, would be to break up and divide these funds. Though the repeal of the laws would have a tendency to prevent combinations, it might not prevent them altogether, the combinations are generally brought on by the mismanagement of the masters, they generally occur among those who work for daily hire, and not those who are paid according to their abilities. The chief cause of objection in the combination laws is, that they apply almost exclusively to the men, and not to the masters, which causes great irritation on the part of the workmen. The laws would apply to masters, but they take such precautionary steps as prevent their proceedings from being known.

Mr. Alexander Galloway, examined. Mr. G. is an Engineer, has often received orders for machinery from abroad, in some instances he has executed such orders, but frequently has been prevented by the prohibitory laws, which have been the cause of his having done less business than he otherwise should have done. All the materials of which machines are made, are the production of our own mines, and the labour of our own people; the amount of labour on machinery is much greater than on other articles; in some cases, such as rough work, three-fifths of the whole cost may be considered as journeymen's wages, while the other two-fifths may be considered for materials, the use of tools, and the profit; but of the fine works, seven-tenths of the cost will be the price of labour. Both these kinds of machinery are prohibited; but under the Act 26 Geo. III. very few things in the shape of machinery, or tools, are permitted to be exported, generally speaking, only those things which the Custom House Officers could not comprehend. A screw, for instance, cannot by any species of disguise be misunderstood by a Custom House Officer, but of a machine for generating screws, he has not the least knowledge; a flatting mill roller is prohibited, therefore every large roller which has such appearance is prohibited.

(*To be continued.*)

New Patents Sealed, 1824.

To Charles Random Baron de Berenger, of Target Cottage, Kentish Town, in the parish of St. Pancras, and county of Middlesex for his discovery and invention of certain improvements as to a new method or methods of applying percussion to the purpose of igniting charges in fire arms generally, and in a novel and peculiar manner whereby a reduction of the present high price of fire arms can be effected; and the priming is also effectually protected against the influence of rain or other moisture. Such invention and contrivances rendering the percussion principle more generally applicable even to common pistols, blunderbusses and muskets, as well as to all sorts of sporting and other guns, by greatly reducing, not only the charges of their manufacture, but also those impeding circumstances which persons have to encounter whilst loading or discharging fire arms when in darkness or whilst exposed to wet, or during rapid progress, serious impediments to the soldiers and sailors, and consequently the service, and most injuriously expensive.—Sealed 27th July.—2 months for inrolment.

To Alexander Nesbitt of Upper Thames-street, in the city of London, Broker, in consequence of a communication made to him by William Van Houten the Younger, a Foreigner residing abroad, for a process by which certain materials may be manufactured into paper or felt, or a substance nearly resembling coarse paper or felt, which material so pressed is applicable to various useful purposes.—Sealed 27th July—6 months.

To Thomas Woolrich Stansfield, of Leeds in the county of York, merchant, for his invention of certain improvements in power looms, and the preparation of warps for the same.—Sealed 27th July.—6 months.

To Edward Cartwright of Brewer-street, Golden-square, in the parish of St. James, Westminster, in the county of Middlesex, Engraver and Printer, for his invention of improvements on, or additions to roller printing presses.—Sealed 27th of July.—2 months.

To Charles Jefferies, of Havannah Mills, near Congleton, silk throwster, and Edward Drakeford of Congleton, watch maker, both in the county of Chester, for their new invented method of making a swift and other apparatus thereto belonging, for the purpose of winding silk and other fibrous materials.—Sealed 29th July.—2 months.

To William Wheatstone of Jermyn-street, St. James's, in the county of Middlesex, music-seller, for his invention of a method of improving and augmenting the tones of piano-fortes, organs, &c.—Sealed 29th July.—2 months.

To John Price, of Stroud, in the county of Gloucester, Engineer, for his invention of certain improvements in the construction of spinning machines.—Sealed 5th of August.—6 months.

To George Graydon, Esq. of the city of Bath, Captain in the Royal Engineers, for his invention of a new compass for navigation, and other purposes.—Sealed 5th August.—6 months.

To William Johnson, of Great Totham, in the county of Essex, Gentleman, for his invention of a means of evaporating fluids for the purpose of conveying heat into buildings for manufacturing, horticultural and domestic uses, and for heating liquors in distilling, brewing and dying, and in making sugar and salt with reduced expenditure of Fuel.—Sealed 5th August.—4 months.

To Jacob Perkins of Fleet-street, in the city of London, Engineer for his invention of certain improvements in propelling vessels.—Sealed 9th August.—6 months.

To John Fussell, of Mells in the county of Somerset, edge tool maker, for his invention of an improved method of heating woollen cloth, for the purpose of giving it a lustre in dressing.—Sealed 11th August.—2 months.

To Herman Schroder, of Hackney, in the county of Middlesex, Broker, for his invention of a new filter.—Sealed 11th August.—6 months.

D.	H.	M.	S.	
1	0	0	0	☉ declination 8° 13′ 41″ N.
1	0	37	0	♀ Passes the merid. dec. 5° 56′ N.
1	6	58	0	☽ passes the meridian.
1	21	37	0	♃ passes the meridian, declination 19° 51′ N.
2	11	0	0	☽ in conj. with 1 ν in Sag.
2	15	0	0	☽ in conj. with ♅ long. 12° in Capr. ☽ lat. 23′ N. ♅ lat. 25′ S. diff. lat. 48′.
2	16	0	0	☽ in conj. with • in Sag.
2	18	0	0	☽ in conj. with π in Sag.
6	0	0	0	☉ dec. 6° 23′ 3″ N.
6	10	51	0	☽ Passes the meridian.
7	23	39	0	Ecliptic opposition ○ full moon.
11	0	0	0	☉ dec. 4° 29′ 48″ N.
11	4	0	0	☾ in conj. with η in Pisces
11	14	23	0	☾ passes the meridian.
12	13	0	0	♀ in conj. with η in Virgo.
13	0	48	0	♀ passes the merid. dec. 9′ S.
13	14	59	15	♃'s 1st. Sat. will immerge.
13	20	0	0	☾ in conj. with η in Taurus
13	21	3	0	♃ passes the merid. dec. 19° 19′ N.
15	19	17	0	☾ in □ last quarter.
16	0	0	0	☉ dec. 2° 34′ 33″ N.
16	12	0	0	☾ in conj. with μ Gemini.
16	18	50	0	☾ passes the meridian.
17	11	0	0	♃ in conj. with δ in Cancer.
17	11	0	0	☾ in conj. with δ in Gemini.
19	0	0	0	♄ Stationary.
19	18	0	0	☾ in conj. with ξ in Leo.
19	22	0	0	☾ in conj. with • in Leo.
20	0	0	0	☿ Stationary.
20	0	0	0	♅ Stationary.
20	6	0	0	☾ in conj. with π in Leo.
20	16	53	1	♃'s 1st. Sat. will immerge.
21	0	0	0	☉ dec. 0° 37′ 59″ N.
21	23	28	0	☾ passes the meridian.
22	10	27	0	Ecliptic Conjunction ● New Moon.
22	13	0	0	♂ in conj. with δ in Scorp.
22	14	5	0	☉ enters Libra.
23	16	0	0	☽ in conj. with ☿ long 18° in Libra ☽ lat. 4° 52′ S. ☿ lat. 3° 46 S. diff. lat. 1° 06′.
25	0	59	0	♀ passes the merid. dec. 6° 16′ S.
25	20	29	0	♃ passes the merid. dec. 18° 49′ N.
26	0	0	0	☉ dec. 1° 19′ 9″ S.
26	3	8	0	☽ passes the meridian.
26	15	0	0	☽ in conj. with δ in Scorp.
28	1	0	0	☽ in conj. with ϑ in Oph.
28	3	0	0	☽ in conj. with B in Oph.
29	11	32	0	☽ in □ first quarter.
29	18	0	0	☽ in conj. with 1 ν in Sag.
29	22	0	0	☽ in conj. with ♅ long. 12° 49′ in Cap. ☽ lat. 37′ N. ♅ lat. 25′ S. diff. lat. 62′.
29	23	0	0	☽ in conj. with • in Sagitt.
30	1	0	0	☽ in conj. with π in Sagitt.

Rotherhithe. **J. LEWTHWAITE.**

The waxing moon ☽—the waning moon ☾.

ERRATA FOR AUGUST.

For 22d. 18h. 27m. 0s. ☉ enters Scorpio *read* ☉ enters Virgo.

METEOROLOGICAL JOURNAL, JULY AND AUG. 1824.

1824.	Thermo.		Barometer.		Rain in inches.	1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	−			Higt.	Low.	+	−	
JULY						AUG.					
26	72	52	29,83	29,80	. .	11	76	55	29,70	29,68	,075
27	68	51	30,10	—,90	,2	12	74	54	,80	—,74	. .
28	73	51	,20	30,18	. .	13	71	48	,84	—,80	,05
29	76	51	,09	29,90	. .	14	69	45	,96	—,92	. .
30	73	48	29,69	—,60	. .	15	66	52	,75	—,55	. .
31	74	45	,67	—,65	. .	16	68	47	,80	—,55	. .
AUG.						17	71	49	,80	—,66	. .
1	66	56	,86	—,67	,025	18	70	51	,66	—,57	. .
2	71	41	30,00	station	. .	19	69	45	,78	—,70	,2
3	72	55	29,97	—,93	,1	20	68	54	,83	—,70	,025
4	70	53	,86	—,80	,075	21	73	55	,82	—,75	,175
5	71	55	,70	station	,1	22	65	51	30,05	—,90	,2
6	68	54	,68	—,63	. .	23	70	45	,09	30,04	,025
7	70	48	,90	—,80	,175	24	67	46	,14	—,13	. .
8	67	51	,86	—,76	,025	25	71	42	,22	—,20	. .
9	75	60	,75	—,67	,025						
10	75	50	,83	—,79	. .						

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

The Second Number of the European Review is now before us, and we are still more pleased with it than with No. I. It contains many amusing original articles, besides reviews and analyses of all the most interesting works recently published, and is moreover embellished with a finely engraved portrait of Goëthe, and two spirited sketches (from the classical pencil of Mr. Howard, Sec. R. A.) of beautiful Antique Gems. We are glad to perceive that the latter are to be continued; and we are sure our readers will concur with us in opinion that a work possessing so many claims to public support cannot fail of attaining a very high rank among the first periodicals of the day.

The 1st. vol. of Lectures of Sir Astley Cooper, Bart. are in the Press, to appear shortly, by Frederick Tyrrell, Esq. Surgeon to St. Thomas's Hospital, on the Principles and Practice of Surgery, as delivered at St. Thomas's and Guy's Hospital.

Ancient Literature. From a Report signed by M. Peyronnet, Keeper of the Seals, and inserted in the Monitor, we observe that the French Government is about reviving the plan of Francis I. for editing the valuable Greek and Latin MSS. with which the Royal Library abounds. The treasures of Oriental Literature in this collection, when carefully examined, will probably yield curious productions and elucidate works and authors as yet imperfectly known. The design is worthy of these peaceful times, and of an enlightened country.

Mr. Fosbroke of Cheltenham, Surgeon, is preparing for publication, some Observations on the Treatment of Deafness, on Improved Principles, illustrated by one case of twenty years, and others of long standing, successfully treated.

Mr. Samuel Burgess, Junr. is preparing for the press, to appear in November. A History of the Ward of Bishopsgate, it is compiled from works of Stowe, Maitland, Pennant, Malcolm, Hughson, and other historians, it will be illustrated by engravings.

It has been announced that in the ensuing Winter, a Description in 4to of the Island of Madeira, left in manuscript by the late Mr. Bowdich, will be published. To which will be added a Narrative of Mr. Bowdich's last Voyage to Africa, terminating at his death; Remarks on the Cape de Verd Islands: and a Description of the English Settlements on the River Gambia, by Mrs. Bowdich.

In the press and shortly will be published, A History and Description of the Ancient Town and Borough of Colchester in Essex, in Royal 8vo. it is to be illustrated with numerous engravings.

Views in Australia, or New South Wales, by J. Lycott, Nos. 1 and 2, of which are published. This great country, which until these few years was only thought of as a place of exile for criminals, has now swelled into so much importance, that we have volume upon volume teeming upon us to excess, and we even find it become of note enough to be worthy of illustrating by the Arts. Among the plates will be found Views of Newcastle, Mount Dromedary, the Table Mountain, Van Diemen's Land, and Becket's Fall on the Apsley River, &c. &c. We understand the succeeding numbers are to be executed on copper, which is very desirable, as many of the views are most miserable failures in Lithography, the accompanying letter-press is brief, but sufficiently descriptive.

Russian Travels in China: Mr. Timkowski, an officer in the Asiatic Department of the office of Foreign Affairs, who was sent with the Russian Missionaries to relieve those that had been resident at Pekin, for the last ten years, is publishing an account of his journey to Pekin and back again, with his observations and adventures during his stay in that city. It is to be comprised in three volumes, the first containing the Journal from Kiachta to Pekin, by the exact statement of each day's journey, important materials will be afforded for correcting the geography of the Northern Part of China, which is very incorrect and defective. The second volume will contain the author's residence in Pekin, a description and plan of that City, with an account of the manners and customs of its inhabitants. The third volume embraces the author's return to Russia, with a concise History of the founder of the Tibetian Religion. The Prophet Budda, whose doctrines are followed by the Mougol, Calmuck, and Burate Tribes, and even by a great part of the Chinese; it will also give a circumstantial account of the Chinese wall, and the City of Urga in the Desert.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLVI.

Recent Patents.

To JOHN HENFREY, *of Little Henry Street, Waterloo Road, in the County of Surry, Engineer, and* AUGUSTUS APPLEGATH, *of Duke Street, Stamford Street, Blackfriars Road, in the County of Surry, Printer, for their Invention of certain Machinery for Casting Types.*

[Sealed 9th October, 1823.]

THIS invention is a machine or apparatus for casting printing types. Plate VII. fig. 1, is a side view of that part of the apparatus to which the mould and matrix is attached. Fig. 2, is a horizontal view of the same, the respective letter of reference pointing out similar parts in both figures; *a* is a wheel, having teeth around the greater part of its periphery, for the purpose of effecting an interrupted rotatory motion, as will be hereafter explained. This wheel is attached to the axle or shaft *b*, which turns in the bearings of the standard or frame; *c* is a flange or parallel plate fixed to the revolving axle, and *d* is also a similar flange or parallel plate, sliding a little distance backward and forward upon the axle, for the purpose of opening and shutting the type-mould, which is situated between these flanges at the upper part; *e* is a bridle or forked piece holding the sliding flange, the end of which bridle drops into a mortice-hole in the revolving axle *b*. At the end of this axle a bolt *f* is introduced, that receives the end of the bridle, and this bolt has a worm spring coiled round it, over which a brass cap or socket is screwed to the axle *b*, for the purpose of confining the spring. By means of this spring therefore, the bolt holding the end of the bridle connected to the sliding flange or plate *d* causes that flange to be pressed up against the fixed plate or flange *e*, and so to keep the mould closed.

The aperture or hopper, as it is called, through which the fluid type-metal runs into the mould, is at top of the parallel plates or flanges *c* and *d*, and the manner in which they lap together, so as to form a square hole between their surfaces, is seen in fig. 2. Below this hopper or gutter, which forms the neck of the type, is the mould *g*, consisting of several pieces accurately fitted together, and adjustable by screws, leaving a long square aperture, into which the fluid metal runs and forms the body of the type. The matrix or die into which the face of the letter is cut, is situate below in the bar *h*, which passes through an aperture in the plates *c* and *d*; this bar is so adjusted and connected to the other machinery, that when the casting of the type is about to take place, the matrix is pressed up and held in close contact with the under parts of the mould.

The bar *h* is mounted upon pivots resting in bearings in the carriage *i*, which enable it to rise and fall; it is pressed upwards so as to keep the matrix in contact with the mould by the spring *k*, and is forced downwards when the matrix is to be withdrawn from the mould by a friction roller *l*, acting against a cam on the inside of the fixed ring *m*, (as the shaft and the other parts of the apparatus revolve.) The position of the matrix bar requiring the utmost accuracy of adjustment in every direction, that is effected by small screws acting against the carriage of the bar, as seen in the figures.

Supposing a type to have been cast in the mould (the process of doing which will be explained after the construction and operation of this part of the apparatus has been described) it will be necessary to withdraw the type so cast from the mould, and this is done by the following means.

A small friction-roller *n* is attached to an arm extending from the bolt *f*, and as the shaft *b* revolves this friction roller acts against an inclined plane *o*, fixed to the end of the standard of the machine; hence it will be seen that when the friction-roller *n* comes upon the elevated part of the inclined plane *o*, the bolt *f* will be drawn back, and with it the bridle *e*, which will cause the sliding-flange or plate *d*, connected to the bridle, to recede from the fixed flange *c*, by that means the mould will be opened. As it is desirable that the mould should open in a diagonal direction, two inclined planes, which lock together by means of a guide, are placed upon the under side of the plates *c* and *d*, so that as the plate *d* withdraws from the plate *e*, it necessarily moves in a diagonal direction. The type frequently sticks in the mould and requires some force to remove it, this is done in the ordinary way by a small hook; in the present apparatus, when the plates or flanges open as above described, the type is forced out of the mould by small spring bolts *p p*, when it falls into a receptacle below.

Fig. 3, is a front view of a portable furnace in which the type-metal is to be melted, and to this furnace two of the machines above described are attached, in the manner in which they are to be used. Fig. 4, is a side view of the same, the letters referring to the like part in both these figures, and also to the part of the apparatus already described.

The furnace and the melting-pot *q* is shewn by dotted lines as situate within the fire brick-case, that and the other parts of the machinery being mounted upon an iron frame with brackets *r r*, upon which the before described type-moulds and their appendages rest; *s* is a fly-wheel turned by a winch, upon the axle of which is the bevel gear that actuates the shafts *t t*. The moulds being in a horizontal position, as shewn at *c c*, in the figs. 3 and 4, have their openings or gutters exactly opposite to the jets *u u* of the melting-pot, and as the shafts *t t* revolve, the tappets *v v*, upon those shafts, strike the levers *w w*, and these pressing down the plungers *x x*, cause the fluid metal to be expelled from the melting-pot *q*, and to be forced through the jets *u u* into the gutters of the moulds, by which means the types are cast. The further rotation of the shafts *t t* cause other tappets *y y*, attached to the wheels upon those shafts, to strike against the wipers *z z* of the wheels *a a*, and thereby carry round the shafts *b b*, and with them the moulds and other appendages of the machine first described at figs. 1 and 2, the toothed segment upon the shafts *t t* taking into the toothed segments on the wheels *a a*, and continuing the rotatory motion of the shafts *b b* as far as is necessary for the performance of the several evolutions of the mechanism explained and shewn in fig. 1 and 2. When the moulds come again into the horizontal position the injecting of the metal is repeated, and another type is cast in each of the moulds, so that every time the shafts *t* and *b* revolve, a new type is produced in each mould, and is pushed out of the mould by the means already described, and is thence taken and dressed as usual by hand.

The specification concludes by saying, " Having thus described the machine or machinery for casting types, and also certain auxiliary machinery with which the same may be conveniently worked; we declare that we do not intend to claim any part of such auxiliary machinery; but we claim as our invention and patent right the machine or machinery for casting types as shewn in figs. 1 and 2."

[*Inrolled February,* 1824.]

To Samuel Sevill, *of Brown's-hill, in the Parish of Bisley, and County of Gloucester, Clothier, for his Invention of a new Mode or Improvement, for Dressing of Woollen or other Cloths.*

[Sealed 13th November, 1823.]

These improvements apply to *the gig mill,* a machine used in the woollen manufacture, for scouring and dressing the surface of cloth. The gig mill is a revolving cylinder, round the outside of which brushes are fixed, usually made of teazles, for the purpose of laying the nap and smoothing the surface, as the cloth passes over the cylinder, in a contrary direction. The object of the present invention, is to adapt a series of fine metal points to the gig cylinder, which shall act as combs by brushing against the cloth, so as to produce the same effect in laying the nap as the teazle heretofore employed.

Plate VIII. Fig. 3 represents a part of the end of a gig barrel or cylinder before-mentioned. In place of the frames containing teazles usually attached to the barrel, a series of the wire combs with their appendages, as at A, B, C, are fixed round the barrel. The comb itself is shewn detached at fig. 4. It is made by laying a series of needles *a a* in a mould their equal distances, and points being carefully adjusted, and then running molten lead, tin, pewter, or other mixture of metals, into the mould, so as to form the back *b* of the comb, exactly as the combs or points of a lace machine are made. These combs are then placed in bearings or hooks as seen at A. fig. 3, turning freely upon their pivots, and are severally held in their carriages as at A B C, by means of springs attached to the rods or shaft *c*.

The comb being mounted in its carriage as at A. fig. 3, and the ends or pivots of the shaft *c* being confined by loops to the carriage, a ratchet-wheel *d* is then attached to the end of the shaft as at B, and a small catch spring *e* is also fixed to the carriage, for the purpose of holding the ratchet-wheel and the shaft firmly. By turning the ratchet a tooth or two, which may be done by means of a winch to be placed upon the square end of the shaft *c*, the helical springs *d d* are wound up, and by that means any desired pressure may be applied to the back of the comb, the object of which is to allow a certain vibratory action or springing of the comb as the cloth passes over the gig barrel, which is shewn by the dotted line *f*, fig. 3. A standard *g*, *g*, *g*, is placed behind each of the combs as a guard, for the purpose of keeping the cloth at a certain elevation ; *h*, *h*, *h* are similar standards before the comb, which regulate the height at which the cloth passes over the gig, and limits the action of the comb points against the surface of the cloth.

If the standards *h* were raised, the points *a* would scarcely touch the cloth, but if they were lowered, the points would be enabled to act with considerable force against it. The adjustment, therefore, of these standards *h*, is very essential to the beneficial performance of the apparatus, and is regulated in the following manner.

The front bar or standard *h* is fixed to a shaft *i*, mounted in bearings upon the carriage, as shewn at B and C. fig. 3; to the ends of each of these shafts *i*, a lever *k* is attached, the tail of which is confined to the circular sliding plate *l*, by a bolt passing into one of the holes of that plate as at B, or the lever may be held by a spring *m*, as at C, bearing against a stop. The inner circle of this sliding plate *l* has teeth, and into these teeth a pinion *h* takes; this pinion is worked by a lever *o*, and hence by shifting the lever *o*, the position of the standard *h h h* will be determined, and they will be held fast by introducing a pin through the slit of the lever *o*, into one of the holes of the fixed plate *p*.

A rail or bar with an indented edge, is proposed to be placed on each side of the barrel in the frame of the machine for the purpose of distending the cloth, and keeping it from wrinkling. It may be found desirable sometimes to employ teazles and brushes, in conjunction with these combs, upon the same gig barrel, or a separate barrel may be combined with the gig mill machiney. The frame of the gig mill is not described, nor are the wheels or other contrivances, by which the barrel is made to revolve, as these are well known, and may be varied in their construction at pleasure. The bars of points being straight, and both sides alike, may be shifted in case the points wear away.

The claims of the patentee are, first the application of wire points, which are nearly or quite non elastic, by means of a joint or hinge; the necessary elasticity being given by a coiled or spiral spring, not directly connected with the wire points; secondly, in the power of applying both sides of the wire point with equal effect; thirdly, in the method of setting the points, and forming the metal to contain them."

[*Inrolled, January,* 1824.]

To William Wigston, *of the Town of Derby, in the County of Derby, Engineer, for his Invention of certain Improvements on Steam-Engines.*

The engine proposed is of the alternating kind, with heavy plungers or pistons, which are intended to be raised by floating in a dense fluid, as mercury: the fluid being forced up in the cylinders by the superincumbent pressure of steam; and where the mercury has withdrawn itself from the cylinders, (the action of the steam being removed from its surface) the plungers or pistons descend again by their own gravity; thus through the agency of the piston rods, an alternating motion is given to the beam of the engine, which communicates its power by a fly-wheel, crank, &c. as usual.

Plate VIII. fig. 1, is a vertical section of two cylinders *a* and *b*, connected at bottom by the semi-circular part *c*, which is of equal diameter to the cylinders; *d* and *e* are two plungers or pistons, formed hollow, so as to float in the fluid metal, and move freely up and down the cylinders; to the tops of these pistons or plungers, rods are attached by bolts or otherwise, which rods pass through stuffing boxes of the usual construction. At the top of the cylinders is the cap *f f*, or nozzle-piece, as it is called, which is affixed to the cylinders by flanges and bolts. Through this nozzle-piece, the passages for the entrance and exit of steam are formed, and the slide valve *g* above, which opens and shuts those passages, is moved by a rack and toothed segment, or other contrivance, actuated by the ascent and descent of the piston or plunger rod, or some such well known means.

The cylinders are proposed to be occupied within about half way up with mercury, or other fluid metal, such as lead and bismuth; if the latter metals are employed, it will be necessary to enclose the cylinders in a heated chamber, so as to keep the metallic compound in a fluid state; this may be done by inserting the cylinders into the flues of the furnace, which heats a steam boiler, or a separate furnace may be employed for that purpose. Steam being admitted to the cylinder *a*, by the slide valve having opened the induction passage, its elastic force will act upon the surface of the mercury, or other fluid metal, in that cylinder, and drive it through the semi-circular tube *c* into the cylinder *b*, by which means the plunger *e* will float and be carried up to the top of the cylinder *b*, while the piston *d* descends by its own gravity to the bottom of the cylinder *a*, as shewn in fig. 1.

The slide-valve now closing the steam passage of the cylinder *a*, and opening that of the cylinder *b*, the pressure of the steam upon the mercury in *b* will force it down, and consequently cause it to rise in the cylinder *a*, which has been exhausted by the slide-valve having opened the eduction aperture leading to the condenser and air-pump. Thus the plunger *d* will be made to ascend by floating, and the plunger *e* to descend by its own gravity, which gives the reciprocating action to the beam of the engine exactly in the same manner as in other steam engines having two cylinders and pistons, the power obtained being equal to the weight of the plunger, added to the difference of the specific gravity between the other plunger and the fluid metal in which it floats.

An engine may be worked upon the same principle with only one plunger, as fig. 2, which is a section of the cylinder; *a* is the outer vessel, of a cylindrical form, with a spherical end; *b* is the inner cylinder in which the plunger *c* moves, this cylinder is open at bottom, and mercury or other fluid metal is introduced, so as to occupy the two cylinders half way up. The top is closed by a cap plate, and a rod passing through a stuffing box is attached to the plunger.

Steam is admitted by the pipe *d* into the box *e*, and passes thence through the pipes *f* and *g* to the inner and outer cylinders; *h* is a slide valve moved by the toothed sector *i;* this valve, as seen in the figure, closes the steam passage *f* leading to the inner cylinder, when the passage *g* being open to the box *e*, the steam enters and presses upon the surface of the mercury in the outer vessel *a*, and forces it up into the inner cylinder *b*, by which means the plunger *c* is raised. The valve *h* having now been slidden over the aperture of the vessel *a*, the steam is shut off therefrom, and admitted into the cylinder *b*, where it exerts its pressure upon the mercury in that cylinder, and causes it to sink therein, and rise in the outer vessel *a*, at which time the aperture of the eduction or exit pipe *k* being opened to the passage *g*, the steam escapes from the vessel *a*, or becomes condensed, which assists the operation; and the plunger *c* now descends by its own gravity. Thus the rod alternately ascends and descends, which being connected to the beam of the engine, causes it to vibrate and exert a lifting power equal to the weight of the plunger, which is considered to be applicable to the pumping of water.

The patentee closes his specification by saying, "I have been obliged to describe many parts in this specification which have been heretofore used and practised, and therefore can form no part of my present invention; such as the employment of fluid metal, that having been heretofore used in some description of steam-engines, as also sliding-valves, cylinders, and many other parts; and I hereby declare, that my said invention consists solely in the employment of moving weights or plungers, contained in cylinders or cases, partly filled with any fluid metal as aforesaid, which said plungers or weights, after being raised by the force of steam in the manner aforesaid, are caused to descend by their own weight or gravity, so as to be capable of actuating machinery without the said plungers or weights being obliged to fit and slide steam tight within the said cylinders, observing that the form and proportions of the different parts may be varied according to the discretion of the workmen employed in constructing the same, as well as the materials of which the same may be made, without departing from the object of my invention, as herein described and set forth."

[*Inrolled, February,* 1824.]

To JOHN GUNBY, *of New Kent Road, in the County of Surrey, Sword and Gun Manufacturer, for his new invented Process, by which a certain Material is prepared and rendered a suitable Substitute for Leather.*

[Sealed 28th February, 1824.]

THE foundation upon which the process is to be employed may be cloth of any kind, either linen, woollen, cotton, or felt, as any of these substances are convenient for the purpose, which materials should be stretched upon suitable frames. When the substance is intended to be pliable, a composition of the following ingredients is to be used. Common glue size, in a gelatinous state, about four parts; fat linseed oil, after having been boiled, about two parts; lamp black, half a part; white lead, ground fine in a mill, about one part; and pipe clay also, ground fine about one part.

When the size is sufficiently melted over a fire, the boiled oil is to be added by degrees, keeping it constantly stirring until properly blended, then add the lamp black, the white lead, and the pipe clay, and when the whole is perfectly mixed and blended together, the composition may be considered as ready for use.

The cloth having been strained, as before said, upon suitable frames, the composition may be laid on in a warm state by a pallet knife, observing that the interstices must be perfectly filled, so that when dried and cut the cloth may be found perfectly saturated with the composition. The frames, with the cloth so prepared, are then to be put in an open situation exposed to the air, or in a moderately warm drying-room, as the season of the year may require, it being a very essential part of the process that the composition shall be made to dry gradually.

When the first coat has become hard, a second, third, and fourth, as may be found necessary, should be laid on, taking care that each coat has become dry before another is added, and it is important that the composition be spread equally and as thin as possible, as a superabundance would prevent the desired pliability. The surface should be rendered smooth, and for this purpose it is proposed to cut the material so prepared into strips, and to pass it between pressing rollers.

In order to give a polish to the surface of the material after it has become smooth, a coat of drying oil or a varnish is to be laid upon its surface, which may be mixed with colour for the purpose of giving it any required tint; by which means when dry it will appear like japanned leather, and is ready to be cut up for use. The patentee speaks only of employing it for making *patten ties*, "such ties being finished in dies under a press or stamp, similar to raising impressions on paper, metal, or horn."

For purposes which do not require pliability, such for instance as coach tops, to the glue-size, the pipe clay and white lead may be added in such quantities as the nature of the article may require. When the pieces are too large to be passed through a roller-press, then the inequalities may be reduced, and the surface polished with powdered pumice-stone, tripoli, or other grinding material, and after having become smooth, the oil or varnish-colour may be applied as often as may be found necessary.

[*Inrolled August*, 1824.]

See Mills and Fairman's Patent for certain improvements in rendering leather, flax, sail-cloth, and other articles water-proof, Vol. VI. page 191.

To JACOB PERKINS, *of Fleet Street, in the City of London, and* JOHN MARTINEAU, *the younger, of the City Road, in the County of Middlesex, Engineers, for their Invention of Improvements in the Construction of the Furnaces of Steam-Boilers and other Vessels, by which Fuel is economised and the Smoke is consumed.*

[Sealed 20th November, 1823.]

THESE improvements consist in constructing and placing the furnace in the interior of the steam-boiler, brewing copper, or other vessel, in such a manner that it may be entirely surrounded by the water or other fluid to be heated, and the heat communicated by the actual contact of the burning fuel against the sides of the furnace instead of the ordinary modes, in which the heat is principally communicated by radiation.

The construction of this apparatus has nothing in it peculiarly novel; a furnace is placed in a recess formed in the interior of the boiler, the fire bars rising about an inch above the level of the bottom; the flues leading from the furnace through the water to the chimney. A hopper is placed above, into which a considerable quantity of coal, in a pulverised state, is put to supply the fire for several hours, and from whence it falls through a tube surrounded by the water.

The fire does not extend upwards above the level of the top of the flue, and as the fuel becomes expended a fresh supply falls down from the hopper. The smoke being conducted through the fire before it reaches the flue, all its combustible part becomes entirely consumed, and thereby the heat of the furnace is considerably increased.

The proportions and form of the furnace may be varied according to the size and design of the boiler to be heated, and in many cases it may be desirable to place the furnace in the centre of the vessel and to lead off with two flues in opposite directions, in which case the opening for the chimney should be placed in the side.

The patentees say they do not mean to claim to themselves the exclusive use of this particular mode of keeping the fire supplied with fuel, excepting only in conjunction with a furnace on the principle described.

[*Inrolled May,* 1824.]

[We do not perceive wherein the novelty of this invention consists; placing the furnace within the boiler is constantly practised and with success, and supplying the furnace with coal by means of a hopper, the tube of which passes through the boiler, is a very common practice.]—Ed.

To Charles Bagenell Fleetwood, *of Parliament-street, Dublin, in that part of the United Kingdom called Ireland, Gentleman, for his new Invented Liquid and Composition, for making Leather and other Articles Waterproof.*

[Sealed 28th February, 1824.]

This new invented liquid, for rendering articles waterproof, consists of a certain compound of resinous, oleaginous, and elastic matters, with which leather and other substances are to be prepared, instead of those animal oils heretofore used.

The patentee commences his specification, by remarking upon what he considers to be the present defective process adopted in currying and dressing leather; with a view to shew the superior advantages of his invention, "under the impression," he says, "that all processes heretofore known for currying leather were in a greater or less degree not only defective, but absolutely injurious to the substance of the leather, I conceived that means might be adopted to change the process of currying as it is at present practised, that constituting the basis of the evil which I wished to remove; for it is an indisputable fact, all animal substances are subject to putrefy sooner than most other things; more especially, sooner than mineral productions, and even than many vegetable matters, such as gums and oils, after having been chemically prepared.

"These considerations suggested the idea of substituting for the perishable animal matters used in the dressing of leather, such imperishable substances as might be drawn from mineral and vegetable productions when properly treated by the chemist. In the first instance, instead of the *dubbing oil* (so termed by the trade) or other fat animal matters, which are extremely liable to decay, and which are almost the only materials employed for softening and preserving the leather, I should substitute a compound, consisting of certain gums and vegetable oils."

In order to obtain the new invented liquid for dressing leather and rendering it waterproof, ten pounds of *caoutchouc*, (Indian rubber) is to be dissolved in twenty gallons of pure spirits of turpentine, by putting them both into a tin vessel of sufficient capacity to hold from thirty to forty gallons. The *caoutchouc* should be cut into small pieces, about the sixteenth part of an ounce weight, by which its dissolution will be hastened. The vessel is then to be immersed in a boiler filled with water, and the fire raised so as to cause the water to boil. In this situation the vessel is to remain until an entire solution of the *caoutchouc* in the spirit of turpentine is effected.

One hundred and fifty pounds of pure bees wax is now to be dissolved in one hundred gallons of spirits of turpentine, adding thereto twenty pounds of Burgundy pitch, and ten pounds of gum frankincense. The solution of these articles is obtained by similar means to those employed for dissolving the *caoutchouc*.

To these two compound fluids, when perfectly cold, ten gallons of the best copal varnish is to be added, and the whole mixed together in a large vessel, where it may be diluted by the addition of one hundred gallons of lime-water, pouring in about five gallons at a time; and stirring it up well, repeatedly, for six or eight hours; which agitation must be repeated whenever any of the composition is taken out of the receiver, either to be bottled or casked.

In order to give a brilliant black japan appearance to the leather when coated with this material, it is proposed to introduce into the quantity above described (before the lime-water is added) about twenty pounds of the best lamp black, which must be first mixed up in twenty gallons of the purest turpentine spirit; observing that this twenty gallons of spirit should have been deducted from the previous mixture.

The composition, when thus prepared, is to be laid upon the leather by means of a painting brush, and rubbed into the surface, which will render the leather, after the composition has become dry, perfectly impervious to water, and at the same time soft and pliable.

The patentee does not confine himself to the precise quantities above stated, nor to the modes of mixing them, but gives them as the best proportion he is acquainted with after considerable experience, and which he is disposed to adopt.

[*Inrolled, August,* 1824.]

To Samuel Hall, *of Basford, in the County of Nottingham, Cotton-spinner, for a certain Method of improving Lace, Net, Muslin, Calico, and every other description of Manufactured Goods, whose fabric is composed of holes or interstices; and also Thread or Yarn as usually manufactured, whether the said*

Manufactured Goods, or the said Thread or Yarn, be fabricated from Flax, Cotton, Silk, Worsted, or any other Substance, or Mixture of Substances whatever.

[Sealed 18th April, 1823.]

In the early part of the year 1818, Mr. Hall inrolled the Specification of a Patent granted to him under nearly the same title as the above; his object was to remove the downy fibres of the cotton thread from the interstices of bobbin net lace, which he effected by singeing the lace with the flame of a gas burner. In the specification of the said Patent, he says, "My method of improving lace or net, or such other goods as aforesaid, is by passing them through, or at a very small distance over a body of flame, or fire produced by the combustion of inflammable gas, while the said flame or the intense heat thereof is urged upwards so as to pass through the holes or meshes of the lace or net, or such other goods as aforesaid, by means of a current of air, which is produced by a chimney fixed over the flame immediately above the lace or net, or such other goods as aforesaid. The action of the frame is to burn, singe, and destroy as much of the said superfluous fibres or fur as may be removed without injury to the lace or net, or such other goods as aforesaid.

"A long piece of lace or net, or such other goods as aforesaid, or several pieces united together so as to form a large sheet, is made to pass between two rollers mounted one over the other, like the rollers of a flatting mill, and the lace or net, or such other goods as aforesaid, are further to be extended over the rollers, so as to spread part of the lace or net, or such other goods as aforesaid, in an horizontal position. Beneath this part the flame is applied, and the rollers being turned round, will cause the lace or net, or such other goods as aforesaid, to pass through or at a small distance above the flame, so that every part of the piece shall in succession be subjected to the action thereof; and the velocity of the movement must be so regulated, that the superfluous fibres of the lace or net, or such other goods as aforesaid, will be acted upon in its passage through or over the flame without having time to injure the lace itself.

"It must be obvious that the rapidity of the motion must depend upon the nature of the lace or net, or such other goods as aforesaid, and the intensity of the flame. It is of course impossible to give any general description of the motion that will be applicable to different cases. A slight trial will however be sufficient in each instance to ascertain and regulate the velocity. A regular and uniform motion will of course be most convenient and advantageous.

"The operation may be repeated as often as is found necessary to effect the required improvement of the lace or net, or such other goods as aforesaid, and the operation will be most readily effected, if the two ends of the piece are united together so as to form an endless band, which being extended over a system of rollers, will circulate about the said rollers when they are turned round, and so every part of the said endless band will pass and re-pass through and over the flame.

"The apparatus for the production of the inflammable gas may be the same which is well known, and in use for the purpose of illumination. The gas is to be conducted in pipes to the machine, and to enter into a tube which is placed horizontally beneath the lace or net, or such other goods as aforesaid; when the lace, or net, or such other goods as aforesaid; have been sufficiently operated upon by the flame acting on one side, the piece is reversed, and the other side is subjected to the action of the flame.

"All the rollers must be made so that they can readily be removed from their bearings, in order to introduce the piece of lace or net, or such other goods as aforesaid, into the machine after the ends thereof are joined together. The gas tube is fixed to the frame at one of its ends, and the other end is supported by a piece of iron, which is attached to the frame. The rollers are longer than the breadth of the piece of lace or net, or such other goods as aforesaid, or than the row of holes where the gas issues, and by this means the lace or net, or such other goods as aforesaid, can be put on the rollers, and they are put in motion before the lace or net, or such other goods as aforesaid, is brought over the flame; but when it is in full motion, it is moved sideways on the rollers, so as to come over the flame. A cock must be applied to the gas-pipe, to regulate the gas, and whilst the lace or net, or such other goods as aforesaid, is put upon the rollers, this cock must be so far closed as to diminish the flame as much as possible without extinguishing the same; and when the lace or net, or such other goods as aforesaid, is put in motion, and fully extended over the flame, the cock is to be opened, and the flame will light up so as to act upon the lace or net, or such other goods as aforesaid.

"During the operation of this machine, it is necessary to extend the edges of the piece of lace or net, or such other goods as aforesaid, before it passes upon the rollers, to prevent folds or creases in the lace or net, or such other goods as aforesaid, which would interrupt the proper action of the frame. It will be proper to attach coarse lace or tape to the edges of the lace, to keep them smooth and even.

"The edges of the lace or net, or such other goods as aforesaid, is to be extended by one or two persons with their fingers, without interrupting its motion. As the lace or net, or such other goods as aforesaid, will be somewhat discoloured by the operation, it may afterwards be bleached by any of the processes in common use. The operation is generally performed once before the goods are bleached; they are then half bleached, and the operation repeated; the bleaching is afterwards finished. The above apparatus or combination of machinery is conveniently adapted for the purposes of the said invention. But I do not claim the exclusive use of any apparatus or combination of machinery, except in connexion with, and in aid of the application of inflammable gas to the purpose above described in this specification."

The patent recently granted, and now under consideration, is for an improvement in the above process, viz. causing a strong current of air to draw the flame of the gas through the interstices of the lace, as it passes over the burner, by means of an aperture in a tube placed immediately above the row of gas-jets, which tube communicates with an air-pump.

Plate IX. fig. 5, shews the construction of the apparatus complete, and manner in which it operates; *a a*, is a gas-pipe supplied by an ordinary gasometer; from this pipe, several small ones extend upwards to the long burner *b b*. This burner is a horizontal tube, perforated with many small holes on the upper side, through which as jets the gas passes; and when ignited, the bobbin, net, lace, or other material intended to be singed, is extended and drawn rapidly over the flame by means of rollers, which are not shewn in the figure.

The simple burning of the gas, even with a draft chimney, as in the former specification, is found not to be at all times efficacious: the patentee, therefore, now introduces a hollow tube *c c*, with a slit or opening, immediately over the row of burners, and this tube by means of the pipes *d d d* communicates with the pipe *e e e*, which leads from the exhausting apparatus.

This exhausting apparatus consists of two tanks *f* and *g*, nearly filled with water, and two inverted boxes or vessels *h* and *i*, which are suspended by rods to the vibrating beam *k*, each of the boxes are furnished with a valve opening upwards; *l l*, are pipes extending from the horizontal part of the pipe *e* up into the boxes or vessels *h* and *i*, which pipes have valves at their tops, also opening upward. When the vessel *h* descends, the water in the tank forces out the air contained within the vessel at the valve *m*; but when that vessel rises again, the valve *m* being closed, the air is drawn from the pipe *e* through the pipe *l*. The same takes place in the vessel *i* from which the air in its descent is expelled through the valve *n*, and in its ascent draws the air through the pipe *l* from the pipe *e*. By these means, a partial exhaustion is effected in the pipe *e e* and the tube *c c*; to supply which, the air rushes with considerable force through the long opening of the tube *c c*, and carries with it the flame of the gas-burners. The bobbin, net, lace, or other goods, being now drawn over the flame between the burner *b b* and the exhausted tube *c c* by means of rollers as above said, the flame of the gas is forced through the interstices of the fabric, and all the fine filaments and loose fibres of the thread are burnt off without damaging the substance of the goods.

To adjust the draft from the gas-burners, there are stop cocks introduced into several of the pipes *d*; and to regulate the action of the exhausting apparatus, an air vessel *e* is suspended by a cord or chain passing over pullies, and balanced by a weight *p*. There is also a scraper introduced into the tube *c*, which is made by any convenient contrivance to revolve and slide backward and forward, for the purpose of removing any light matter that might arise from the goods singed, and which would otherwise obstruct the air passage.

Two of these draft tubes *c* may be adapted and united to the exhausting apparatus when a double row of burners is employed, and the inclination of the flame may be directed upward, downwards, or sideways, according to the position of the slit in the draft tube, by which means any description of goods, may, if required, be singed on both sides at one operation.

The apparatus is calculated not only to improve lace, by singeing the fibres from the surface of the thread, but is also applicable to singeing a variety of other goods, as cotton fabrics, and particularly cotton stockings, which are proposed to be laid upon an endless web, of small cords extended over rollers, and by giving a rotatory motion to those rollers, the stockings or other articles may be conducted over the gas-burner, and the flame passed through the interstices of the fabric, by the exhausting apparatus above described; by which the texture of the goods will be made to look fine, and their general appearance considerably improved.

The spun thread before it is woven or twisted may also be improved in this way; and brushes may be introduced in convenient parts of the roller frame, for the purpose of raising the nap upon the thread before it passes through the flame.

The same air draft apparatus is also applicable when the goods are singed by heated air, or any other flame beside that of gas, and in every such way the patentee claims the use of this his new invented apparatus, for increasing the draft of the burners, in singeing such goods as aforesaid, and thereby drawing the flame through the interstices.

[*Inrolled, October,* 1823.]

[There have been two other patents subsequently granted, for improvements in the modes of singeing bobbin net, lace, and other articles, one of which has been obtained by Mr. Briant Donkin, of London; the other by Mr. Jarvis Boot, of Nottingham; these we shall endeavour to give in our next.]—Ed.

To RICHARD GREEN, *of Lisle Street, in the Parish of St. Anne, Soho, in the County of Middlesex, Saddler's Ironmonger, for his Invention of certain Improvements in constructing Gambadoes or Mud Boots, and attaching Spurs thereto, and Parts of which said Improvements are also applicable to other Boots.*

[Sealed 13th November, 1823.]

THE improvements claimed under this patent are, first, in the construction of the gambadoe or mud-boot, used for shielding the legs of a horseman from the splashing of mud, and secondly, in the modes of attaching spurs both to them and to boots generally. The stirrups of these gambadoes are made open on one side in order to prevent the foot of the rider from hanging in them in case of his accidentally falling from the horse's back. Two of these gambadoes are shewn in Plate IX. fig. 1 and 2, varying a little in their construction. The stirrup is shewn detached at fig. 3, and is proposed to be made of steel instead of iron, in order to afford additional strength. The lower part of the stirrup is made cylindrical, and is intended to for man axle, upon which the sole of the boot, made of plate iron or other stiff material, vibrates. The situation of the stirrup is at *a a* in the figures and *b* is the sole vibrating upon its axle. In fig. 1, the sole extends the whole length of the foot and moves upon the axle; but in fig. 2, the toe part only moves, the hinder part of the sole being a fixture to the back of the boot, and to the under part of the stirrup.

The leg of the gambadoe is made of leather as usual and the strap by which it is suspended to the saddle passes from the eye of the stirrup up through the loops in front; the back of the boot at fig. 1, is made to extend a little distance below the heel, for the purpose of keeping out the wet, and the hinder part of the sole is held up by a strap and a helical spring, enclosed within the lining, and cased in oil skin in order to prevent its rusting. In the construction of the gambadoe shewn at fig. 2, this last contrivance of the heel strap and spring is not necessary, as the hinder part of the sole is united to the leg of the boot.

The method proposed of attaching spurs to these boots as at *c c*, fig. 1 and 2, is by fixing a socket to the hind part of the boot and slipping the spur into that socket when it is required to be used. The construction and mode of adapting this spur is shewn in fig. 4, which is a section of the socket and of the standard of the spur; *a a* is the socket; *b* a helical spring introduced into the socket, pressing the plug piece *c* upwards, which piece is intended to close the upper part of the socket when the spur is not attached; *d* is the standard of the spur carrying the rowel *e*; the upright part of this standard is introduced into the socket by pressing down the piece *c* and the helical spring *b*. To the upright part of the standard a spring catch *f* is attached, which by stopping against a lip on the inside of the socket holds the spur securely in its place, and which cannot be withdrawn from the socket but by pushing back the spring *f*, and thereby releasing the catch.

That part of the improvement which applies to other boots consists in employing the helical spring *b*, and the plug piece *c*, in the sockets of spurs usually called box-spurs, for the purpose of closing the holes in the sockets without employing the ordinary plugs used for that purpose.

[*Inrolled January,* 1824.]

To MAURICE DE JONGH, *of Warrington, in the County Palatine of Lancaster, Cotton Spinner, for his New Invented Mode of Constructing and Placing a Coke Oven under or contiguous to Steam or other Boilers, so as to make the Heat arising from making Coke or other intense Combustion in the said Oven subservient to the use of the Boiler, instead of Fuel used in the common way, and to exclude such Heat from the Boiler when required without detriment to the operations of the Oven.*

[Sealed 28*th February,* 1824.]

THE principal feature of this invention is, combining a boiler with a coke oven, for the purpose of beneficially employing the heat which radiates from the oven in generating steam or boiling water for brewing or any other use, without the expence of fuel, and which plan also embraces in its detail convenient modes of regulating the heat communicated to the boiler, and of cutting it off altogether if required.

The patentee proposes to place an oven of about eight feet diameter under the front part of a boiler, so that the centre of the oven shall be about two feet six inches from the front of the boiler. The wall of the oven is to be straight for about eighteen inches high in the usual way, and above this the crown or arch rises about two feet six inches. In the centre of the crown a circular opening is formed of about two feet diameter, which is denominated the crater, through this the heat is intended to pass to the boiler above, the under-side of which is brought as close to the top of the oven as possible. From the crater the heat proceeds through a circuitous flue round the boiler, and thence to the chimney as usual.

The span between the bottom of the boiler and the oven is to be all enclosed except about one foot square, where a fire-proof damper is to be suspended by a chain passing through the upper part of the brick-work. This chain is conducted over a pulley, and carries weights as a counter-balance to the damper, which slides up and down in grooves, for the purpose of opening or closing the square hole.

Close to the crater on the top of the oven two iron plates are placed parallel to each other. They are fastened together in front by a cross plate, and behind are worked into a low wall of two courses of brickwork erected across the top of the oven. At a small distance from the plates ribs of iron are placed, on which fire stones or fire bricks are laid, in order to form a cover to the crater. This cover is made to slide on the plates over the crater by means of racks on the side-bars, which racks pass through the front wall to the outside of the building, and are there worked by pinions fixed on a revolving shaft turned by hand, thus the crater may be partially or entirely opened or closed.

Another flue, about six inches lower than the crown of the oven, is formed, to communicate directly with the chimney, where there are dampers to open or shut this, and also the boiler flue. In front of the oven is an iron frame, forming a door, to be lined with fire-brick. The method of lining this door is by cutting the uniting edges of the fire-brick in a bevel and dove-tailed form, so that one lapping over the other the whole is made fast by securing the key brick.

The patentee observes, "Now it will readily be understood, that when the cover is removed from the crater, and the damper of the oven flue shut, the heat operates upon the boiler, and raises steam; by means of the inclosure damper, the heat may be kept longer under the boiler, where it acts more powerfully than in the flues, and when required to remove the heat from the boiler, the crater damper, or cover, must be shut, (by means of the racks and pinions,) also the boiler damper in the chimney must be shut, and the oven damper opened. By these means, such a portion of heat may be applied to the boiler as may be required, and the operation of making good coke still go on, and the coke will repay what the coals have cost, or more. The boiler is very greatly preserved by these means, as no cold air comes in contact with it, nor coals, nor coal rake; the smoke is also burnt: as it is well known, that to make good coke, about fifty square inches of opening in the chimney are at first sufficient, and nine at last. This small opening keeps the heat so much back in the oven, that the smoke is nearly all consumed before it can pass of."

The claims of the patentee are, a method of constructing a coke oven in connection with a boiler, so as to make the heat arising from the coke answer the purpose of fuel used in the common way; and to take off the heat from the boiler, when required, without detriment to the operation of cokeing. The advantages derived are considered to be great: in the first place, the expence of fuel is repaid by the coke; secondly, the preservation of the boiler is effected in a greater degree than could be imagined, as no cold air is admitted to it, nor is the fuel or any other matter suffered to touch its bottom; hence it remains unimpaired, and free from the effects of sudden expansion or contraction; thirdly, the consumption of smoke in the coke oven is most complete, and if required a retort may be added for generating gas.

[*Inrolled, April,* 1824.]

We are favoured by the following remarks from the patentee:—"During last winter I have worked an oven under a large boiler of twenty-six horses power, and regularly sold the coke to iron founders, millers, and maltsters; but as this boiler was connected with others, and the effect of burning the smoke could not be distinctly seen when the other boilers were also worked, I have built a separate chimney, and put a distinct boiler, with an oven under it, to that chimney, and successfully now work my patent coke oven in the manner before described, and am now building more ovens in this town. The invention is of great importance to those who require strong coke, free from sulphur and metal; and in addition to what Dr. Ure, Mr. Parkes, and other eminent men have published upon this subject, I flatter myself to be able, from my present experience, to give some more light on the subject of coke."

To JOSEPH JOHNSON, *of Waterloo-bridge Wharf, in the County of Middlesex, for certain Improvements on Drags to be used for Carriages.*

[Sealed 16*th April*, 1823.]

IT is stated that these improvements on drags to be used for carriages, consist in a method of letting fall a staff suspended by the upper end to the axle-tree, near the back part of the nave, which staff has a shoe at bottom, attached by a joint, and that shoe is brought in contact with the ground by means of a chain or strap passing over pullies, to be let fall by the driver whenever circumstances require it, without stopping the carriage.

Plate IX. fig. 6. represents a stage coach, with the drags attached, but drawn up; fig. 7. is a back view of the wheels and axle tree, shewing the drag in action. The drag is shewn removed from the coach at fig. 8, and consists of the staff *a*, with an eye at top, by which it is suspended from a staple on the underside of the axle-tree. At the lower end of the staff is a joint, by which the shoe *b* is connected to it; and at the end of the shoe is an eye for the holding chain to be attached to. Fig. 9. is a curved cross bar, suspended by a staple from the reverse side of the axle-tree, as seen at *c*, fig. 7; the end of this bar passes through a slot at the lower part of the staff, and on the outside, at the extremity of the cross bar, is a clip or fastening, *d*, to keep the bar from dropping out of the slot; and a spring, *f*, on the side of the staff keeps the cross bar in its place. To this clip, *d*, the drawing chain or cord, *e e*, fig. 6 is attached, and by it the staff is drawn up, as seen in that figure.

When it is necessary to let fall the drag, the driver turns the winch *g*, near the coach box, and by unwinding the cord *e e*, permits the drag to go down, which, coming in contact with the ground, raises the wheel off the ground, as seen at fig. 7. When the drag is to be drawn up, the winch *g* must be turned the reverse way, which will cause the cord *e e* to raise the end of the cross bar *c*, and permit the curved part of the bar to slide in the slot of the staff, at the same time being permitted to fall back, the wheel comes again in contact with the ground, and the drag is raised to the position shewn in fig. 6.

This drag is applicable to different descriptions of carriages, and is susceptible of slight variations in its construction. The patentee states, that his claim of invention consists in "letting fall a drag when the carriage is in motion forward; the drag or drags immediately receive their bearing independent of the wheel, and may be released at pleasure, as before described and exhibited in the drawings. And lastly I do declare, that by virtue and in consequence of the arrangement of the parts of the drag it is rendered convenient for the immediate purpose of being used by the person driving, or any other appointed to attend it; thereby affording a more perfect security to passengers in or on carriages, safety to goods and cattle, than has hitherto been done by any of the methods in use."

[*Inrolled, October* 1823.]

[The principles and construction of this drag appear to be precisely the same, in every particular, as one for which Mr. Clark, of Bath, obtained a patent about five years back; and that had, in its leading features, been anticipated by the patent of Mr. Thompson, for a carriage drag, about ten years ago.]—Ed.

Original Communications.

To the Editor of the London Journal of Arts.

SIR,

I TAKE the liberty of submitting to your inspection the following crude schemes for "Rotatory Steam-Engines," which I humbly think may, in many instances, be advantageously employed, being both economical and occupying comparatively but small space.

Plate VIII. fig. 5, is a profile, and fig. 6, a vertical section of one which operates entirely by atmospheric pressure. Suppose A, a wheel (with a heavy rim) having vanes or sails similar to the common ventilator, and enclosed in the box B, so that one surface is exposed to the atmosphere. Now if in the box B a partial vacuum be created, there will be a pressure on the vanes of the wheel proportionate to the perfection of that vacuum, and the wheel will revolve as the sails of a windmill. Let this vacuum be formed alternately in the two cylinders C C (communicating with the box B) by the admission and condensation of steam. There will then be a difference of pressure on the two sides of the wheel A, which will be as the cubic content of the cylinder C to the cubic content of the box B. The power thus obtained is *all gained*, for none is expended in its production *by the wheel itself*, save the friction of its axis; and at the same time pistons may be worked to the full extent of atmospheric pressure by making the rods to pass through stuffing boxes in the top of the cylinder, the two forces may both be directed to the same object, and thus the power of an atmospheric engine may be at least *doubled*.

Fig. 7, is a section of a steam-wheel which operates by a gain of leverage or a continual change of centres. It consists of a number of cylinders A A, of small diameter, radiating from the centre, and each furnished with a piston and rod, to which are attached the weights B B, by moving which further from or nearer to the centre, the power is to be produced. There is a tube at C, communicating with the steam generator; the remainder of the nave is connected with the condensor. The operation is obvious and simple—suppose the wheel in motion, one of the cylinders being arrived at C, the steam forces up the piston, as at D, *where it is retained by a catch;* passing on it immediately becomes connected with the condensor; on arriving at E the catch is liberated, and the piston is forced to the bottom of the cylinder by the pressure of the atmosphere, and the weight B raised, or the length of the ascending lever reduced one-half. The motives for opening the communication with the condensor so immediately, when the atmospheric action was not required till the arrival of the cylinder at E, was to prevent the waste of steam which would otherwise occur, (for it would require a constant pressure of the steam to keep the pistons and weights in their proper positions) and to afford time for a more perfect condensation.

If we suppose the diameter of the cylinder six inches, the atmospheric pressure (taken at 10lbs. only on the inch) on that area will be about 280lbs.; call it 250, and make the weights B B each 250lbs; we shall then have a preponderance of 750lbs. on one side of the wheel.

The length of the cylinders is immaterial; if they are a foot in length and eight in number, about twenty feet of steam (of an elasticity of 10lbs. on the inch) will be consumed in each revolution; the power will of course be increased by the weights, number, and diameter of five cylinders. If the diameter be eight inches, weights of 500lbs. may be used, and the power will be doubled. It might not be impossible to make each cylinder to consist of three or four parts, *to slide one within the other*, (as telescope tubes) which would extend by the pressure of the steam, and then collapse by the atmospheric pressure to one-third or one-fourth. Thus making the leverage three or four to one, and multiplying the power proportionably without an *equal* increase in the consumption of steam, or in the size of the engine. In both of these I have confined myself to the bare exposition of *principles*, as the details of valves, catches, and sundry appurtenances necessary to the minor parts, would have been but a waste of your valuable pages, and must of course be within the reach of every practitioner.

If you deem them worthy of publicity you will much oblige,

Sir,

Your most obedient Servant,

GORDON D. BROWNE.

To the Editor of the London Journal of Arts.

SIR,

WHILST the sciences are making such rapid strides towards perfection, and when each day brings some addition to philosophy, we hear, with but little surprise, of new discoveries however extraordinary, and taught by past wonders to look for a continued recurrence of the marvellous, we are naturally pre-disposed to give credence to reports however much at variance with reason. It appears then to be no way strange, that an engine should be discovered, in which, economy, simplicity, and immense power are united, and the notice of a "pneumatic," or "vacuum," or "explosive engine,"* which would "*entirely supersede the use of steam,*" as nearly all the periodicals of the day, except your own, have declared, was received and believed as a matter of course, with but little doubt of its fulfilment, looked forward to with patient certainty. It is much to be regretted that such reports should be sent forth to the enquiring world by persons possessing little or no knowledge of the principles of experimental science. This surprising engine surprises only by its total want of all the good qualities kind fame had assigned to it, and its being again the subject of an unfortunate patent. The only part of this "novel extraordinary engine" to be wondered at, is, that a scheme so often tried and condemned before, in various shapes, should now, for the first time, make a noise in the world. In its construction most undoubtedly a very great deal of ingenuity is displayed, and it is to be lamented that the inventor had no sounder principles to bestow it upon—for that he is unfortunate in his choice a few words will I think suffice to shew: assuming the most favourable position, we will suppose *pure hydrogen* is issued in lieu of oil or coal gas. Let the cylinder in which the vacuum (by courtesy so called) is to be formed, contain 5 cubic feet of air, in this there will be one part of oxygen, and four of azote; by the burning of the injected hydrogen, the oxygen will be consumed, and the temperature of the azote will be raised perchance from 50 to 200 deg. thereby encreasing its elasticity about one-third. This azote would then occupy a space of about 5⅓ feet, the one-third necessarily passes off through the valves; and the cylinder being cooled down to its original temperature, the remainder will be reduced in bulk to 3¾ feet, leaving a vacant space in the cylinder of 1¼ foot, which will be filled by water forced up by the pressure of the atmosphere. Thus the whole effect of each operation will be to raise 1¼ cubic feet of water, and about 2 feet of pure hydrogen will be required to produce it. If common gas be employed, as the inventor proposes, the effect must be still less, for during combustion it yields carbonic acid *equal to the quantity of oxygen consumed*; from which it is evident that its power must depend solely upon the degree of rarefaction caused by the heat of burning gas. Thus much for the principle as employed to raise water—when pistons are to be worked by it, it is evident that its power would scarcely overcome the friction of its pivots; for when pure hydrogen is employed, supposing the proportions as before, the piston will descend through about one-third only of the height of the cylinder, and before the process can be repeated, the azote which occupies the other two-thirds of the cylinder *must be expelled* (for to continue the operation without so doing must eventually choke the cylinder.) How this is to be effected we are not informed—certainly the power generated by the descent of the piston will not do it. If carbonated hydrogen is made use of, *no vacuum at all* will be formed, for the before mentioned reason; that the oxygen consumed is re-placed by an equal volume of carbonic acid. That in fact, in whatever way the engine is modified, its effects must always be very limited, and by no means equal to the expense, for atmospheric pressure or a very trifling weight of water is all that is obtained, and unless the cylinder be filled with *pure oxygen,* which might all be consumed, a vacuum or any thing approaching to it can never be effected. The very idea of its "superseding steam" is absurd, for the greatest power of atmospheric pressure is 15lbs. on the inch, and the power of a water-wheel must depend on its diameter and the weight of water used. How far this will bear comparison with high pressure steam is self-apparent. The atmospheric steam engine is the only one it *could* supersede, and even that would have the advantage of greater simplicity.

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* See pages 39 and 56 of our present volume.

I am, Sir, your most obedient servant,

PHILOSOPHICUS.

Cambridge, 19*th August*, 1824.

White's Lamp for the Table.

WE considered that the very fair proposal of our correspondent, W. D. (see page 142*) would have brought the subject under discussion to a final issue, but we have received another letter from Mr. White, which he calls a reply, and requests us to permit him by its publication to close the correspondence with W. D.; at the same time, however, stating that he shall always be ready to court reasonable discussion on any of the subjects which he has treated in his "Century of Inventions." Had the matter contained in this letter tended to explain any misconception, or throw any fresh light upon Mr. W.'s project (which really appears to us rather obscure) we should have been happy to have given it publicity, but we regret that any of our readers should so mistake the objects of a Scientific Journal as to suppose its pages can be occupied by correspondences penned in the character and temper of Mr. W.'s last letter.

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* Errata, p. 143, line 3, for *trite* read *tart.*

That we may not be suspected of any undue partiality to either of our correspondents, we shall insert the latter part of Mr. W.'s communication, which indeed appears to us the only part that applies to the subject; and as we do not expect that many of our readers will have the opportunity of availing themselves of Mr. W.'s invitation, we shall, whenever the lamp comes under our observation in a tangible shape, take that public notice of it which its merits may warrant.—ED.

"My lamp," says Mr. White, "is now lighting my pen to dispel every doubt on the subject; but as W. D.'s applause and censure hang on my mind *in perfect equilibrio*, I cannot consent to devote this invention to the service of an unknown censor, who complains of my *abuse*, although he did not scruple to bespatter me with abuse more real and malignant: nay, to accuse me of being a public deceiver! (See W. D.'s letter in your Journal, for June, 1824.)

"Here then I take my leave of W. D. But if any friendly traveller should wish to see this lamp burning, I will show it him with pleasure; and indeed I shall soon give it bodily to the public, as an *earnest* of the useful reality of *the other objects* described in my "Century of Inventions."

"I am, Sir, your obedient servant,

"JAMES WHITE.

"*Manchester*, 17*th September*, 1824."

Allaying the Dust on Roads.

IN consequence of our notice of the projected plan of Mr. Gilmore for allaying the dust on roads, (see page 37 of the present Vol.) we have received a communication from that gentleman, which among other matters contains the following statements of an experiment tried lately in London.

"On Wednesday morning, the 25th of August, I applied a portion of the article called Bittern, or Mother-water,* upon that part of Regent-street which has been Macadamized, commencing at the lower extremity of the street, and ending in a line with Jermyn-street, which has not been washed over with the salt material more than once, except in a few spots where the water-cart went wrong by accident; it has had the desired effect of completely allaying the dust for more than a week, and promises to retain that property for several days longer; it also supersedes the great friction and injury occasioned by common watering, and besides prevents the frequent annoyance of water-carts, together with only being once dirty for a number of days, instead of being twice, and in some cases three times dirty every day. When it may require renewing, which will probably be in about a week hence, it will require a very trifling quantity to restore it again, owing to so much of the salts of the first application being retained, particularly if the weather continues so long dry; and in addition to those properties, it has a propensity to destroy vegetation, and would therefore be valuable to gentlemen for applying to the walks of their pleasure grounds, and thereby prevent the necessity of their being loosened by howing, at the same time assisting in binding them together."

It will require time to ascertain how far this process may answer the purpose before such a plan can be taken into serious consideration, and its adoption will depend upon the price at which the material can be furnished. It appears however to have attracted considerable attention by the many applications which have been made to us for information upon the subject, we therefore give the above, which is all we are at present acquainted with, and from the advanced state of the season apprehend that nothing satisfactory can be said as to its practical usefulness until next summer.—Ed.

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* Bittern, or Mother Water, is the remainder after the crystalization of common salt in sea water, or the water of salt springs. It abounds with sulphate and muriate of magnesia, to which its bitterness is owing.

Novel Inventions.

Bobbin Net, or Buckinghamshire Lace.

The very great demand for bobbin-net lace made by machinery has raised this article to an important place among the manufactures of the kingdom. Less than twenty years back so insignificant was the lace trade in England, that its production was confined to the labours of a few females in the villages about Northampton and Buckingham, who by the tedious process of twisting threads round pins upon a pillow, wove narrow lace, such as is usually employed on the borders of frills; the superior kind being then imported from the continent, where it is generally supposed to have been made in convents. The application of machinery to that manufacture has now however so amazingly extended the means of supply, and also improved the quality of the article made, that we have a constant and increasing market for bobbin-net lace both at home and upon the continent, which our present means, great as they appear to be, are far from sufficient to satisfy, although the lace trade, in its several branches, is estimated to employ at present in

Nottingham and its neighbourhood, within the distance of fifty miles round that town, more than a hundred thousand persons.

An obscure individual named Whitaker is said to have been the first whose ingenuity constructed a piece of mechanism which gave to a series of bobbins, by means of levers and other machinery a twisting movement similar to the movement of the bobbins upon the pillar; how far his views were matured we know not, but he shortly afterwards died in a workhouse near Nottingham. Mr. John Heathcoat appears to have been the first who produced a lace making machine in a mature state, and for which he obtained a patent in 1808. Several ingenious modifications of this machine have been subsequently introduced by other persons, varying in their principles of operation, but producing ultimately a similar kind of net. The patent right of Mr. Heathcoat was however a barrier to their employment, except under his licence, which appears to have been granted to about one thousand machines in and about the neighbourhood of Nottingham. This patenl right expired in 1822, and with it the licences expired also; since which time the ingenuity of the mechanists has been on the alert to improve and simplify the different kinds of machines employed for making lace.

Among these Mr. Heathcoat himself, (who now has a very extensive establishment at Tiverton, in Devonshire) has very recently introduced a machine, in which the movements of the bobbins are differently effected to his former modes; for this invention he has obtained a patent; he has also lately obtained patents for certain modes of regulating the supply of the warp threads, and of accommodating the winding up of the net to the increased diameter of the beam-roller; likewise for im provements in the mode of manufacturing parts of the machinery, and for a peculiarly constructed fire-proof building for containing his machine, the frames of which form the bearings and beams of the erection.

Mr. Mosely, of Nottingham, has also invented and obtained a patent for a mode of putting to work by power that description of lace machine called *Lever's* principle. Instead of working the machine by the hands and feet as heretofore, Mr. M. has introduced a revolving shaft, which by an interrupted crank-motion actuates the bars which move the bobbins, and by a tappet-wheel brings up the points that form the meshes.

Mr. Lingford, also of Nottingham, has invented and obtained a patent for a mode of adapting to work by power, as well as by hand, three different constructions of lace machinery; viz. the *circular bolt*, the *circular comb*, and the *straight bolt* machines. In doing this he has adopted a peculiar construction of right angle gear, in which a centripetal pinion is employed, and also a novel modification of the endless screw, with some other ingenious adaptation of mechanical powers which greatly improve and facilitate the operation.

A patent has likewise been recently granted to a manufacturer in Nottingham, for the invention of various improvements in lace machinery; but as the specification has not been inrolled within the prescribed time, this patent is necessarily forfeited.

So important does this branch of manufacture appear to be, that new inventions applicable to lace machines are daily coming forward, and we are acquainted with no less than five different constructions of machines, all of them possessing considerable ingenuity, which it is probable will shortly become the subjects of patent rights.

As soon as the pressure of other matters will permit us, we shall report the above patents, with plates explanatory of the different inventions and their modes of operating.

Polytechnic and Scientific Intelligence.

National Gallery.

THE notice in our August number of this interesting exhibition concluded with a list of the few English paintings that have been thought to deserve classing with the works of the elder worthies of the art; and though we take it for granted that most of our readers have seen them, yet as they possess but secondary powers of attraction, compared with the masterpieces of the Dutch, Flemish, and Italian schools, we shall again enumerate them. They are the series of *Marriage à la Mode*, and *Portrait of Himself and Dog*, by Hogarth; *Portrait of Lord Heathfield*, (the defender of Gibraltar), by Sir Joshua Reynolds; and the far famed *Village Festival*, by the inimitable Wilkie.

Hogarth's works form a part of every gentleman's library, and it would be folly to speak of them critically; the merits of the *Marriage à la Mode* are well known, and so are its defects; in beauty of colouring these paintings surpass all his other works, and, with some trifling exceptions, they are equally admirable in design.

The most faulty, or rather the least perfect of the series, is the one (No. 4, if we recollect right) representing the infidelity of the wife, the murder of her husband, and the escape of her guilty paramour; the drawing of the two former appears to us incorrect, and the expression is certainly any thing but natural: these, however, are but spots in the sun, which are visible but to few, and detract nothing from its splendour. The *Portrait of Himself and his favourite Dog* has been much talked of; our expectations were highly raised, but we were disappointed: it is perhaps every thing that might be expected from his pencil on such a subject, but Hogarth was not a mere portrait painter—he was something *far superior*; his fame rests abstractedly on what we may call his moral stories, and next to these on his broad and too often coarse humour. He belonged to the higher order of caricaturists*, and it is in this character that he will be admired to the latest time, or, as a certain self-complacent critic has it, speaking of the duration of a painter's immortality,

> "Till chaos come again and *swallow* all."

Sir Joshua Reynolds may, on this last point, be considered the antipode of Hogarth; his fame is built *par excellence* on his portraits, for though he was *a neat hand*, as Jacob Tonson called his good authors, at any thing, yet his best pictures, *Mrs. Siddons as the Tragic Muse*, and *Garrick between Tragedy and Comedy*, owe their celebrity, and are in fact merely subservient to his talents as a portrait painter. Of these talents the portrait of *Lord Heathfield* is a good specimen; the gallant veteran seems to be living before us, with an expression of countenance which he might have displayed on witnessing the destruction of the floating batteries during his memorable and heroic defence of Gibraltar. We are satisfied with the portrait, as the production of a British Artist, but the disparity between ancient and modern painters cannot be more strikingly illustrated than by *Lord Heathfield* and Raphael's *Pope Julius the Second.*

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* There is one artist of the present day whom we should wish to see turn his attention from the contemptible trifles which occupy it, (trifles which nothing but his genius could dignify) to any work worthy of himself and of his country. He possesses all Hogarth's perception of the humourous, without his grossness, and he need but to apply the resources of his own mind to equal, perhaps to *surpass* that great artist. We mention not his name, but there are few who will not recognise the subject of this just encomium.

> " Look on this picture, and at this."

Marriage à la Mode was purchased by the late Mr. Angerstein, in 1797, for 1000*l.*; we are not acquainted with the history of Sir Joshua's *Lord Heathfield.*

We have almost concluded our brief survey, and disinclined as we are to the mania of *essay-writing*, with which many of our brother Editors are so desperately infected, we must indulge in a few observations. Ours, however, grows from and belongs to the subject before our readers, for we do not see the necessity of travelling from Indus to the Pole in speaking of a gallery of pictures in Pall Mall. In the first place then, we rejoice to see a room in this public Institution appropriated to the productions of British Artists; and we are equally glad that among these the pre-eminence is thus given to Hogarth and Sir Joshua. It is an indication of good taste, for these painters must justly be considered as the fathers of the British School of Art; Sir Peter Lely and Sir Godfrey Kneller, (who though a native of Germany may be considered an English artist) being, in our opinion, mere antiquated daubers. We had no painters before the middle of the last century, and sorry are we to think that so few have appeared since, notwithstanding the munificent patronage which has been afforded to genius by some few of the first persons in the kingdom. We scarcely know of one artist whose works are worthy of a place in a National Collection ; perhaps we must except Morland, and *perhaps* Gainsborough; living artists are of course out of the question in a free, impartial, and unreserved criticism, as we wish this to be accounted: personal prejudices or partialities cannot operate as to the dead, and except the three or four we have enumerated, we know not of one whose name is worth the trouble of writing on this page, pressed as we are for time and displeased with so unpromising a subject. Our country is fertile in genius: in the ruder arts and sciences no nation, ancient or modern, has surpassed us; but in the polite ones of painting, sculpture, architecture, and music, we are lamentably barren, and the causes of this barrenness we shall endeavour to investigate in a future paper.

We have said that living artists do not come within the sphere of this notice, and yet we cannot forbear to speak of Wilkie's *Village Festival* any more than we can refrain from looking at it when visiting the gallery. It is a beautiful work, and Wilkie is an admirable painter, but there are faults in both; and who or what is without? Wilkie has been called *the modern Teniers*, and in purity of design he leaves the ancient far behind; but there is one essential defect in his pictures—the foreground is unnaturally filled up, being either left bare as if the painter was undecided what to choose from a variety of ideas, or crowded with objects that never could have been there in the common course of nature. We remember a remarkable instance of this in a portrait (and a very fine portrait it was) of His Royal Highness the Duke of York, exhibited by Wilkie, at the Royal Academy, some years ago. We do not recollect the year, but it was when we used to think the Somerset House Exhibition worth visiting: the picture was of a cabinet size, the Duke was represented sitting in his Study, and every thing was admirable, in drawing, colour, and effect, but so crowded and confused, with chairs, tables, &c. that it seemed as if the illustrious Commander-in-Chief had been amusing himself, as Cardinal Richelieu was wont to do after severe study, by leaping successively over every article of furniture in the room. Wilkie is a great painter, notwithstanding, and may console himself under all the strictures of all the critics that ever snarled, by the assurance not only that his works will adorn the walls of our National Gallery, but that his name will be deservedly classed among those of the first artists Britain can produce.

We cannot conclude without expressing our perfect satisfaction with all the arrangements under which the Gallery is open to the Public; they are liberal and accommodating, and what is particularly worthy of approbation, that reproach to us as a nation, the exaction of money to view our public establishments, is avoided. Every facility is gratuitously afforded to the Public, and to artists in particular; our readers may judge to what extent, when we declare that the only alteration to be wished for is that the numbers of the pictures referred to by the descriptive catalogue should be somewhat larger.

PROCEEDINGS OF LEARNED SOCIETIES.

Horticultural Society.

July 6. A Special General Meeting was held for the election of a member of the council in the room of the late John Walker, Esq.; when Sir Claude Scott, Bart. was unanimously chosen.

The following papers were read:—Description of an Instrument for effectually applying tobacco fumigation for the destruction of insects on trees and plants. By Mr. John Read.

Observations on, and an account of a collection of seeds, found in the neighbourhood of Constantinople, and transmitted to the Horticultural Society of London. By the Rev. Robert Walsh, LL.D., and Corresponding Member of the Society.

Description of a remarkable Elruge Nectarine Tree, in the garden of Lord Selsey, at Westdean House, Sussex. By Mr. John Bowers, Gardener to Lord Selsey.

July 20. The following papers were read:—Description of a Peach Tree in the garden of Miles Stapleton, Esq. at Carlton, Yorkshire. By Mr. John Seymour, Gardener to Mr. Stapleton.

A Report upon the new or rare plants which have flowered in the Society's garden at Chiswick, from its first formation up to March, 1824. By Mr. John Lindley, F.L.S. &c., Assistant Secretary for the garden.

August 3. The following papers were read:—On the Advantages of Coating Garden Walls with Oil Paint. By William Cotton, Esq. F.H.S.

On the Cure of Disease in Onions. By Mr. Thomas Smith.

August 17. On Artificial Climate considered with regard to Horticulture. By John Frederick Daniell, Esq., F.R.S. &c. In this highly interesting paper, Mr. Daniell explains the whole phenomena of radiation, and points out the best means of preventing the destruction of plants, &c. by frost. The artificial climate of the hot-house is also treated of, and the errors of the usual modes of heating fully explained.

Royal Academy of Sciences of Paris.

April 5. M. Thenard, in the name of a Commission, presented a very favorable report relative to the experiments communicated by M. Sérulas, on the Cyanuret of Iodine. The Memoir of this able chemist will be printed in the *Recueil des Savans Etrangers.* M. Cuvier read a Memoir on a new genus of fossil reptiles, discovered within these few years in England, and named Ichthyosaurus. M. Frison communicated a demonstration of the Theorem of Fermat. M. Andouart read some considerations on the origin and causes of the Yellow Fever.

April 12. A communication was received from M. Ringler, who has invented two machines representing the movements of the planets, requesting that a commission may be appointed to examine them. M. de Castel-Bajac requested the Academy would cause the conditions to be examined, to which it will be necessary to subject the plates of fusible metal, which the Government had in contemplation to adapt to the boilers of Steam-engines. Professor Simonoff, of Kazan, presented a Memoir on the *Integral Calculus.* M. Magendie communicated an observation which he had lately made on the effects of the lesion of the great commissure of the cerebellum, above the passage of the fifth pair. The animal subjected to this experiment fell down on the side on which the nervous tissue was divided, and lost the agreement of motion of its eyes M. du Petit-Thouars read the first part of a report which he had drawn up, in the name of a commission, on a notice of M. Romain respecting the anatomy of plants. M. Poncelet, Capt. Eng., presented a manuscript work entitled, A Memoir on the General Theory of Reciprocal Polarity, in continuation of his Memoir on the Centres of Mean Harmonics. M. Magendie, for himself and M. Gay-Lussac, read a report upon a Memoir of M. Chevreul, on several subjects of Organic Chemistry. The Memoir was approved by the Academy, and will be printed in the *Recueil des Savans Etrangers.* M. Bosc made a verbal report on a notice addressed from Moscow, by M. Fischer, relative to an insect known in Persia by the name of *Mianah.* M. Ampére read, for himself and M. Becqueril, a note on an experiment relative to the nature of the Electric Current.

Native Calcutta Society.

A Literary Society has been founded at Calcutta, by native Indians of distinction, the object of which is truly praise-worthy. It is intended to enter into discussions on all subjects connected with the progress of civilization and literature. Works of learning and general utility are to be published in English; and little manuals of morals and science, tending to impugn certain inveterate customs, and to lay down rules of reformation conducive to the well-being of individuals in Bengal. To promote these ends, mechanical and mathematical instruments, together with a chemical apparatus, are to be procured. A house is to be erected, for the purpose of holding their assemblies, and containing their different collections. A College will be annexed, for instruction in the arts and sciences.

On the Solution of Copper in Ammonia, by Dr. J. M'Culloch, from Brewster's Edin. Journal.

It is an unaccountable omission of chemists, not to have observed that copper is soluble in ammonia; I mean, of course, in the metallic state. This solution takes place rapidly in the heat at which the water of ammonia boils. The water is decomposed during the process, for the purpose of oxidating the metal, and hydrogen is obtained.

This fact may be turned to use in the arts. Gold trinkets, such as chains, are often made of a very inferior alloy; and, in this country I believe, they are never better than eighteen carat gold. They of course require to be coloured, to use the jeweller's term. This is done by dissolving the copper of the alloy to a certain depth on the surface; so that after this operation the metal is in fact gilded, nothing but pure gold being visible. The coat of pure gold is thus so slight, that it easily wears off in use; so that the operation of cleaning, (as it is supposed to be by the owners,) requires to be frequently performed, and this is done by a fresh process of solution, or colouring.

The method used by the artists is the application of a mixture of neutral salt, intended to disengage nitric acid, with the assistance of heat. In whatever manner, however, this is managed, there is much gold also dissolved in the operation; so much indeed, that where much work of this nature is performed, the quantity of metal rescued from the solutions amounts to a very considerable quantity annually. Artists are accused of doing this with fraudulent views; with what truth I shall not pretend to say. Whatever the fact may be as to this, a few repetitions of the colouring process are sufficient to destroy the finer kinds of workmanship, to the great regret of our ladies.

Boiling in ammonia is a safe substitute for this pernicious process, as it dissolves the copper from the alloy, and leaves, in the same manner, a gilded or yellow surface. It has the advantage that it can be performed by any one, without the necessity of employing an artist.

The oxidation of copper plates is a matter of very great importance in the arts; nor are the printers aware of the injury which these sustain in consequence of it. It is usual in all great and expensive works, not to print more impressions at once than are required for the present demand, when the plates are laid aside till they are again wanted. Thus they are often kept for many years; while, after each operation, they acquire an iridescent oxidated surface, which is removed by the hand of the operator in the first inking. A scale is thus repeatedly removed from the plate, to the great injury of all the finer lines; producing bad impressions, and, together with the ordinary injury from the hand and the chalk, at length rendering it what is technically called rotten and useless.

The mere operation of inking must, in time, wear out any plate, even in the most careful hands; but this evil would be diminished by preventing the oxidation in question; which, in some cases, produces a far thicker crust than would be imagined, and is, in itself, sufficient to be a cause of very serious injury to the distances and fainter parts.

This evil might be diminished by printing more impressions at one time; but, where it is necessary to lay the plate aside, it might be entirely prevented by varnishing. For this purpose, common lac varnish is easily applied; and it can be removed, when requisite, by spirit of wine. The varnish of caoutchouc might also be used for the same purpose, but I know not that it is more convenient.

Abstracted Report of the Select Committee of the House of Commons, on Machinery and Artizans, &c.

(Continued from Page 165.)

Mr. Alex. Galloway further examined.

Mr. G. has been often sent for to the Custom House, to explain the intention of machinery about to be exported, and has always endeavoured to shew the officers the absurdity of their interference with matters which they do not understand. He remembers an instance of some machinery going to South America. "We have stopped this," said the officers; "for what reason," asked Mr. G., "because we do not know what it is." He immediately told them the use of the machine, and they answered, "that is an object which the prohibitory laws does not mention; but if it is susceptible of being converted into any prohibited machine, it cannot be allowed to pass." Mr. G. told them there is nothing in the shape of machinery which the ingenuity of man could not apply to some other object, different from its original intention; a machine being made of abstract parts, those parts can be converted to a variety of purposes. Mr. G. however was allowed to export the machine, upon assuring them that it would take as much or more labour and skill to alter the plan of this machine than to produce a new one.

Mr. G. believed that a great many prohibited articles had been exported, by being made to appear destined for one purpose, when they were really intended for another. The prohibiting laws have been inconvenient, by compelling the mechanist to make certain parts of a machine in an improper way, to conform to the act; as, for instance, where a screw joint should connect the rod to the piston of a steam engine, a bolt has been used, because a screw of that size is not allowed to be exported, and for no mechanical purpose whatever can a screw be permitted to pass, if it exceeds one-half inch diameter; the reason urged by the Government is, that the coining press, the button press, and stamping presses in general are prohibited, and those screws may be taken from a steam engine, or a saw mill, and applied to a stamping apparatus.

(To be continued.)

New Patents, Sealed 1824.

To John Vallance, of Brighton, in the County of Sussex, Esq. for his Invention of an Improved Method or Methods of abstracting or carrying off the Caloric of Fluidity from any congealing water (or it may be other liquors;) also an Improved Method or Methods of producing Intense Cold; also an Improved Method or Methods of Applying this Invention so as to make it available to purposes with reference to which Temperatures above or below the freezing point may be rendered productive of advantageous effects, whether medical, chemical, or mechanical.—Sealed 28th August.—Six Months for Inrolment.

To James Nivell, of High Street, Southwark, in the County of Surry, Engineer, and William Busk, of Broad Street, in the city of London, Esq. for their Invention of certain Improvements inPropelling Ships, Boats, or other Vessels or Floating Bodies.—Sealed 6th Sept.—Six Months.

Nem Comet.

The path of the Comet at present seen, which was discovered by that indefatigable Astronomer, Gambart, on the 27th of July, may be thus traced. It was first observed near a star of the 5th magnitude, on Cerberus, near the head of Hercules, about 17° deg. N. dic., from whence it moved over the shoulder and part of the body of Hercules, continuing its course through a small portion of Corona Borealis, it again entered the constellation Hercules, crossed the orbit of the comet which visited our hemisphere in January last, passing a little above the triangle X 1. 2. 4. in the leg of Hercules, and proceeded above the head of Bootes. On the 18th inst. it formed nearly an equilateral triangle with two stars of the 6th magnitude, near the hand of Bootes. It is at present, (24th Sept.) among the smaller stars of that group, and will in a few days pass above the hand of Bootes, and enter the tail of the Great Bear. The corruscations unfrequent, and the brilliancy of the comet very variable, sometimes appearing as one of the faintest of the Nebulæ, and again darting out its rays on all sides for a considerable distance.

H.	D.	M.	S.	
1	0	0	0	☉ dec. 3° 16′ 6″ S.
1	1	5	0	♀ Passes the merid. dec. 9° 14′ S.
1	7	31	0	☽ passes the meridian.
1	20	11	0	♃ passes the meridian, declination 18° 35′ N.
2	13	51	43	♃'s 2nd. Sat. will immerge.
6	0	0	0	☉ dec. 5° 12′ 7″ S.
6	11	2	0	☽ Passes the meridian.
6	15	8	37	♃'s 1st. Sat. will immerge.
7	15	56	0	Ecliptic opposition ○ full moon.
8	10	0	0	☾ in conj. with η in Pisces
9	14	15	44	♃'s 4th Sat. will immerge.
9	16	26	6	♃'s 2nd Sat. will immerge.
10	13	0	6	♃'s 3d Sat. will immerge.
10	16	29	14	♃'s 3d Sat. will immerge.
11	0	0	0	☿ Stationary.
11	0	0	0	☉ dec. 7° 6′ 29″ S.
11	1	0	0	☾ in conj. with η in Taurus
11	15	0	0	☾ passes the meridian.
13	1	18	0	♀ passes the merid. dec. 14° 46′ S.
13	15	0	0	☾ in conj. with η in Gemini.
13	17	2	6	♃'s 1st Sat. will immerge.
13	18	0	0	☾ in conj. with μ Gemini.
13	19	24	0	♃ passes the merid. dec. 18° 9′ N.
14	11	0	0	☾ in conj. with ζ in Gemini.
14	18	0	0	☾ in conj. with δ in Gemini.
14	22	0	0	♀ in conj. with 2 α in Libra.

D.	H.	M.	S.	
15	4	25	0	☾ in □ last quarter.
16	0	0	0	☉ declination 8° 58′ 28″ S.
16	19	38	0	☾ passes the meridian.
17	3	0	0	☾ in conj. with ξ in Leo.
17	7	0	0	☾ in conj. with ο in Leo.
17	16	57	51	♃'s 3d Sat. will immerge.
19	4	0	0	♀ in conj. with γ in Virgo.
20	10	0	0	♂ in conj. with B in Oph.
21	0	0	0	☉ dec. 10° 47′ 17″ S.
21	20	3	0	Ecliptic Conjunction or ● New Moon.
22	13	23	54	♃'s 1st Sat. will immerge.
22	23	8	0	☉ enters Scorpio.
24	1	0	0	☽ in conj. with δ in Scorp.
25	1	32	0	♀ passes the merid. dec. 19° 26′ S.
25	11	0	0	☽ in conj. with ϑ in Oph.
25	12	0	0	☾ in conj. with B in Oph.
25	20	0	0	☽ in conj. with ☿ long 23° in Sag. ☽ lat. 43′ S. ♂ lat. 1° 21 S. diff. lat. 38′.
25	18	55	0	♃ passes the merid. dec. 17° 47′ N.
26	0	0	0	☉ dec. 12° 32′ 6″ S.
26	3	48	0	☽ passes the meridian.
26	12	30	3	♃'s 4th Sat. will immerge.
27	2	0	0	☽ in conj. with 1 ν in Sag.
27	7	0	0	☽ in conj. with ο in Sag.
27	10	0	0	☽ in conj. with π in Sag.
29	6	2	0	☽ in □ first quarter.
29	15	17	15	♃ 'st Sat. will immerge.
31	0	0	0	☉ dec. 14° 12′ 2″
81	7	41	0	☽ passes the meridian.

Rotherhithe. **J. LEWTHWAITE.**

The waxing moon ☽—the waning moon ☾.

METEOROLOGICAL JOURNAL, AUG. AND SEPT. 1824.

1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	—	
AUG.					
26	73	56	30,28	30,27	. .
27	70	52	—,23	—,14	. .
28	73	53	—,04	29,94	. .
29	79	49	29,89	—,88	. .
30	76	52	—,88	—,86	. .
31	73	59	—,95	—,87	. .
SEPT.					
1	82,5	54	30,00	—,97	. .
2	84*	53	—,01	—,98	. .
3	83	52	29,96	—,90	. .
4	74	62	—,85	—,80	,2
5	71	47	—,76	—,69	. .
6	69	55	—,53	—,46	. .
7	66	52	—,48	—,47	,25
8	62	52	—,44	—,39	,105
9	63	40	—,72	—,58	,275
10	66	50	—,74	—,70	,4
SEPT.					
11	66	52	29,73	29,63	,425
12	62	55	—,80	—,59	,325
13	68	45	30,05	—,96	,125
14	69	50	29,99	station	. .
15	76	60	30,09	29,98	,025
16	69	41	—,17	30,16	. .
17	73	51	—,13	—,09	. .
18	75	56	—,04	29,97	. .
19	68	55	29,88	—,84	. .
20	59	53	—,80	—,79	,3
21	59	45	—,83	—,79	,1
22	67	49	30,00	—,94	. .
23	63	52	29,90	—,89	,05
24					
25					

CHARLES H. ADAMS, LOWER EDMONTON.

* This day the Thermometer attained a greater height than before during the summer, also 6° higher than during the summer of 1823.

LITERARY NOTICES.

A Work called Select Proverbs of all Nations, has been recently published with Notes. A Summary of Ancient Pastimes, Holidays, and Customs; and an Analysis of the Wisdom of the Ancients, and of the Fathers of the Church. By Thomas Fielding, pp. 216. Longman and Co.

Though this little work appertains to no one of the Arts and Sciences, it may be said to range over all; and even if it did not, its merits would demand notice and approbation. We have seldom met with a more amusing work, considering the unassuming title under which it has entered the world; and we recommend it to both young and old as really embodying the whole laconic wisdom of the Ancients, and illustrating most of the sayings, *vulgar and polite*, that are familiar to Englishmen's mouths as household words: It contains, besides, a fund of information in the shape of Notes, and is *got up* in a pleasing and elegant style; the *arrangement* of the work itself is worthy of imitation in books of more pretensions, and its general merits, not the least of which is its moderate price, cannot fail to ensure it an extensive sale.

In the Press, to appear in a short time, Outlines of a Medico-Chirurgical Education, containing illustrations of the Application of Anatomy, Physiology, and other Sciences, to the principal practical points in Medicine and Surgery, with plates, by Thomas Turner, of the Royal College of Surgeons of London.

Mechanics. A Company is projected with a subscribed capital of 200,000*l*. to apply Mr. Brown's Gas Engine, (recently described in our Journal,) to the propelling of Wheeled Carriages; their first proof of the success and maturity of the invention is to be the Driving of a Coach from London to York, and back again, at the rate of ten miles an hour.

There is considerable talk among the literati of the quarter of St. Germain, on the subject of two new works, now in the press, by an ancient Officer of Dragoons, who is known to the world, by a Voyage to Louisiana. One of the Works is a Polyglott Glossary, by means of which a person may make himself understood in eighteen different languages, without having a previous knowledge of any of them. The other is an Universal Aretography, for the use of persons in all stations of life, affording easy means of information on every possible subject. We hope that these works when published, will reach this side of the water, that some of their wonderful contents may be propagated to our benefit.

New Chemical Society. An Institution has, we understand, lately been founded in London, the purport of which is to promote the study of Chemistry in all its branches. It appears from the book of regulations, that Lectures, Discussions, Experiments, and a Lecture Room and Library, are to be open during five days in the week, and that ordinary meetings are to take place once a fortnight. Considering the universal utility of the science of Chemistry and the wonderful advances that it is making, we cannot but wish this young Society every success.

On the 23d. Mr. Scheffer, the inventor of a new Life Preserver, made an exhibition of its utility in the preservation of Life in the case of Shipwreck, in the River Thames, between Blackfriars and Waterloo Bridge, in the presence of a large assembly on the opposite shores. He remained in the water for upwards of two hours, and sustained for a length of time, five persons that swam to him, with the greatest ease to himself.

Two new Bathing Companies, one bearing the appellation of the Royal National Bath Company, the other, that of the Metropolitan Marine, have issued their claims to notice; in design they approach nearly to each other, except that the former intends to set out with a subscribed capital of 250 000*l*. or 300,000*l*., and the latter with a needful capital of 500,000*l*., which is to be employed in erecting five or more establishments of baths, to be supplied with sea-water, by means of steam engines and pipes, to furnish the population of London with the advantage of good and convenient bathing.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLVII.

To Sir HENRY HEATHCOTE, *Knight, and Captain in the Royal Navy, for his Invention or Discovery of an Improvement in the Staysails generally in use, for the Purpose of intercepting Wind between the Squaresails of Ships, and other square-rigged Vessels.*

[Sealed 13th December, 1823.]

THESE improvements consist in a particular form given to such sails as are used on board square rigged vessels, called staysails, and in the arrangement of the tackle belonging thereto, which is designed to increase their effect in aid of propelling the ship, and to lessen the power of the back-wind which escapes from staysails as they are now constructed, which back-wind acting against the topsails, considerably impedes the progress of the vessel.

The exact forms of these improved staysails will depend upon the dimensions and positions of the various spars and rigging of each ship to which they are to be fitted; but the rules of measurement which determine the shapes will be the same in all ships. Plate X. Fig. 1, is a diagram, exhibiting a side elevation, drawn to a regular scale of the masts and yards of a vessel as braced to an angle of thirty-three degrees for the main and fore, and twenty-eight for the mizen, which diagram will answer to ascertain the shapes of all the staysails suited to different vessels.

To obtain the form of a MAINTOPMAST STAYSAIL, draw a line from the maintopmast head *m*, to such point *a* on the foremast as will allow of stowing this sail up and down abaft the mast in the same manner as the old mizen staysail; this will be the line of the head of this staysail. For the foot of this sail, let a horizontal line *b* be drawn aft from the tack, and the breadth of the foot of this sail is subject to the same rule as has heretofore guided sailmakers in this respect, while the swell will be added in the usual manner. The rule is, that the leach of the staysail shall not come so far aft as to bear against the lee braces, nor so far as to prevent its traversing easily over the stay, immediately under it. For ascertaining the rake of the leach of this sail, it will be the same when trimmed at an angle of twenty-five degrees, as the line of leach of the mainsail when trimmed at an angle of thirty-three degrees. In the diagram, *c* is the leach of the mainsail; this, with the breadth, as before given, will determine the length of the head of this sail.

The rule for forming a MAINTOP GALLANT STAYSAIL is to draw a line from the maintop gallant mast head *n*, to the point *d* on the foremast, to which the old middle and top gallant staysail used to be hauled down for the purpose of stowing; this will be the line of the head of this staysail. For the foot of this sail, let a horizontal line *e* be drawn aft from the stay, on a level with the top of the forecap *f*, and the breadth of this sail is subject to the same rule as heretofore guided sail-makers, while the swell will be added in the usual manner. For ascertaining the rake of the leach of this sail, it will be the same when trimmed at an angle of twenty-five degrees as the line of leach of the maintopsail *g* when trimmed at an angle of thirty-three degrees. This, with the breadth as before given, will, of course, determine the length of the head of this sail.

The admeasurement of the Main Royal Staysail is to be found by drawing a line from the main royal mast head *p* to a point *r* on the foretopmast, below the cross-trees, which will be one-third of the distance from the foretopmast cap to the point on the head of the foremast, to which the main top gallant stay has been described to lead. This will be the line of the head of the staysail, and for the foot of this sail, draw a line *s* aft horizontally from the stay, on a level with the foretopmast futtock staff *t*. For ascertaining the rake of the leach of this sail, draw a line *u* from the peak of the maintopmast staysail *v*, cutting the peak of the maintop gallant staysail *w*, and crossing all the upper stays, and the point at which it crosses the main royal stay *x* will be the peak of the main royal staysail. The rake of the leach of this sail must be determined by the breadth of the foot, which breadth must be subject to the same rule with regard to the stay next below it, as has been mentioned to be the sail-maker's ordinary rule.

Having described the rules by which the shapes of the principal staysails on the mainmast are determined, the patentee proceeds to state, that part of his invention consists in the employment of intermediate or auxiliary staysails above each of the three principal staysails before described.

The rule for forming the AUXILIARY STAY-SAIL of a MAIN TOP MAST, is to draw a line from the main top mast head *m* to a point close above the fore cat harpings 3, this will be the line of the head of the sail, the length of which will be determined by the line *u*; the peak of this sail being at that point where the line *u* intersects the auxiliary stay. For the foot of the sail, let a horizontal line 4 be drawn aft from the fore cat harpings 3. The rake of the leach of this sail must be determined by the breadth of the foot, which breadth must be subject to the same rule with regard to the stay next below it.

The AUXILIARY STAY-SAIL of a MAIN TOP GALLANT must be formed by drawing a line 5 from the main top gallant mast head *n* to a point on the fore top mast 6, which will be exactly half the distance between the point on the fore mast head *d* to which the main top gallant stay leads, and that part of the fore top mast head 7, just above the top mast shrouds. This will be the line of the head of this auxiliary stay-sail. For the foot of this sail, let a horizontal line 8 be drawn aft from the point of the fore top mast 6. The rake of the leach of this sail must be determined by the same rule as the last mentioned.

The admeasurement of a MAIN ROYAL AUXILIARY STAY-SAIL is to be ascertained by drawing a line 9 from the main royal mast head *p*, to the point 7 on the fore top mast head just above the top mast shroud; this will be the line of the head of this auxiliary stay-sail. For the foot of this sail, let a horizontal line 10 be drawn aft from the point 7, and the leach of this sail must be determined by the rule above stated.

A MIZEN TOP GALLANT STAY-SAIL is formed by drawing the line *h* from the mizen top gallant mast head

&c, to a point *k* on the main mast just above the cat harpings; this will be the line of the head of this stay-sail; for the foot of it draw *l*, a horizontal line, aft from the line *h*, on a level with the main top rail *j*. The rake of the leach *q* of this sail, when trimmed at an angle of twenty-five degrees, will be the same as the rake of the leach of the mizen top-sail *o* when trimmed at an angle of twenty-eight degrees, and that point 13 of the line *l* where it is intersected by the line *q* will determine the breadth of the foot of this stay-sail, which being a light weather sail, should be worked by a brail, and is not therefore subject, as regards the breadth of the foot, to the sail-maker's ordinary rule.

The admeasurement of the MIZEN ROYAL STAY-SAIL may be found by drawing a line 14 from the mizen royal mast head 15 to a point 16 on the main mast head just below the cap; this will be the line of the head of this stay-sail. Let a horizontal line 17 be drawn aft from the line 14 on a level with the first reef band 18 of the mizen top sail, and this will give the foot. The rake of the leach 19 of this sail must be determined by the breadth of the foot, which breadth will depend upon that of the sail below it, and be subject to the rule before given.

The manner of fitting and rigging these sails is as follows: Each principal stay-sail, except the main top-mast stay-sail, is to be provided with a running or veering tack, which enables the sails to be hoisted up the stay in the positions shewn at A, B, C, D. The main top mast stay-sail, and all the auxiliary stay-sails are fitted in the same manner as ordinary stay-sails. The stay-sails upon this improved principle must not be set on stays leading in the ordinary position, nor are they to be trimmed in the usual way, but must be rigged on stays, the positions of which must be particularly adapted for them, as shewn in the diagram. The sails are proposed to be trimmed when the wind is at an angle of twenty-five degrees with the line of the keel.

The patentee in concluding his specification states, that a kind of stay-sails called *gibized* have often been used, but the form of such sails has been determined either by cutting off the tacks or the nocks, and these gibized stay-sails have been heretofore furnished with the same kind of tacks, and have been set on stays rigged in the same situation as for the quadrangular stay-sails, but it is not considered that such are constructed upon the principles herein proposed and claimed. "But stay-sails gibized according to the rules herein before laid down, and consequently assuming the form herein-before described, which said form is necessary to produce the effect of intercepting the wind between the square sails to the greatest advantage, as also such mode of fitting and rigging the said improved stay-sails being entirely new, &c. is herein claimed."

[*Inrolled, June* 1824.]

To WILLIAM FURNIVAL *of Droitwich, in the County of Worcester, Salt Manufacturer, and* ALEXANDER SMITH *of Glasgow, Master Mariner, for their Invention of an Improved Boiler for Steam Engines, and other Purposes.*

[Sealed 9th December, 1823.]

THIS invention is the attachment of a boiler on the top of another boiler, in order that the steam, as it rises from the lower vessel, may, by coming in contact with the bottom of the upper vessel, communicate the heat thereto. In Vol. VII. of this Journal, page 190, under the head "James Smith's Patent," will be found the description of an apparatus for boiling and concentrating solutions in general, but particularly for crystalizing of salt and sugar. The present patent is for an improvement upon that apparatus, which is referred to in the specification, and appears to have become the property of the present patentees.

Plate XI. fig. 1, shews a boiler of the improved construction; *a* is the boiler above alluded to, the top and bottom being held together by a series of screw bolts; *b* is a funnel and pipe, by which water is introduced into the boiler to be heated; *c* is the safety-valve loaded. There is a gauge cock for ascertaining the depth of the water, which should be about two inches, and also cocks for drawing it off when the boiler is to be emptied. Thus far is the original invention of James Smith. It is now proposed to add the upper vessel *d*, which is to be tied together by bolts like the former, and furnished with a safety valve *e* and gauge cocks. There are also two steam pipes *f f* issuing from the upper vessel.

If about two inches of water be introduced into the boiler *a*, and a fire be made under it, the steam will rise against the bottom of the upper vessel, which being, by means of the pump *g*, half filled with cold water, will cause the steam, as it comes in contact with the surface of the upper vessel, to give off its heat, and becoming condensed, to fall down, as a shower, into the boiling water; so that the water in the lower vessel will seldom need to be replenished, while it will heat the water above sufficiently to generate steam for the purpose of giving motion to engines and other machinery. The advantages of this contrivance are, that a great extent of equally heated surface is obtained by the steam from the lower vessel acting uniformly against the underside of the top vessel as the heating medium, and the upper chamber thereby becoming the steam boiler or generator of steam for working the engine.

It is further proposed to form the steam chamber in compartments, by plates or partitions attached by flanges and rivets to the top and bottom, and to perforate these plates at the upper parts for the purpose of allowing the steam to pass freely along the whole chamber from one compartment to the other.

This plan is not confined to any particular form or dimensions, though an oblong square is deemed most eligible, and it is to be considered that the invention consists in the superadded boiler for generating steam, which is done exactly in the same way that the evaporation is effected in the before-mentioned patent apparatus.

[*Inrolled, June,* 1824.]

A contrivance for boiling by the transmission of heat from steam, by placing several vessels one above the other, the lower one only being heated by the fire, has been the subject of a patent granted to William Johnson. See Vol. VI. Page 128.

To PHILIP CHELL, *of Earl's Court, Kensington, in the County of Middlesex, Engineer, for certain Improvements on Machinery for Drawing, Roving, and Spinning Hemp, Flax, and Waste Silk.*

[Sealed 18th February, 1823.]

THE machinery employed by the patentee, for drawing, roving, and spinning hemp, flax, and waste silk, is nearly the same in its construction as that usually employed for drawing, roving, and spinning cotton. The improvements described are claimed under five heads; the first of which is a mode of placing and removing at pleasure the several pairs of drawing rollers to any required distance apart; the second is the introduction of an endless web between certain of the drawing rollers, for the purpose of supporting the fine drawn filaments of the material operated upon; the fourth, the introduction of a guide roller to conduct these filaments between the drawing rollers; and lastly, the adaptation of these improvements to every construction of stretching frames and mules for drawing, roving, and spinning hemp, flax, and waste silk.

Instead of placing the ends of the drawing rollers on bearings or standards fixed to the frame work of the machine, as usual, the patentee proposes to enable the bearings to slide upon side bars, and to make them fast with screws at any distance from each other, that may be found desirable, according to the length of fibre of the material about to be drawn. The drawing rollers are placed in pairs, turning upon pivots in these bearings, the lower rollers being of iron, with small grooves formed lengthways in their peripheries, the upper or pressing rollers, with weighted levers bearing upon the ends of their axles, being also usually of iron, but covered with leather. As these rollers revolve, the filaments of the hemp, flax, or waste silk operated upon, are drawn through between them; and the several pairs of rollers placed in rows behind each other, being made to turn with different velocities (progressively diminishing in speed) by means of bands and riggers, or toothed wheels and pinions, actuated by a first mover, cause the material operated upon to be stretched, or its filaments drawn out lengthways, for the purpose of rendering the thread thus moved or spun of a thin or fine quality.

The upper rollers employed for pressing upon the lower or grooved rollers are, by the patentee, proposed to be made of a series of collars of leather, cut round on their outsides, with a hole in the middle. These collars are to have a metal rod or shaft passed through them, and to be pressed tight by metal caps at the ends, so as to form leather cylinders, the peripheries of which are to be varnished, for the purpose of rendering them impervious to water.

The endless web is proposed to be introduced between the second and third pairs of rollers, to support the filaments when drawn extremely fine; and a plain wooden roller is to be placed upon this endless web, for the purpose of conducting the filaments between the last pair of drawing rollers, previous to passing them to the flyers, where they are roved or spun into a thread or fine cord.

As these improvements apply generally to stretching frames and mules for roving and spinning hemp, flax, and waste silk, and do not materially affect the construction of those machines, it is not necessary to describe all or any of them, as they are all well known; the claims of the inventor being limited, first, to the adaptation of shifting carriages or bearings for the rollers; secondly, the construction of the pressing rollers by the combination of collars or discs of leather; thirdly, the endless web for supporting the roving; fourthly, the guide roller upon this endless web for conducting the filaments; and lastly, the adaptation of these inventions to the machines above-mentioned.

[*Inrolled, August*, 1823.]

To JOHN BOURDIEU, *of Lime Street, in the City of London, Esq. in consequence of a Communication made to him by a certain Foreigner residing abroad, for the Preparation of a Mucilage or Thickening Matter, to be used in Printing or Colouring Linen, Woollen, and other Cloths and Silks, in cases in which Gums, Mucilages, or other Thickening Matters are employed.*

[Sealed 24th April, 1823.]

THE mucilage here proposed, is to be made from the seed of a tree called *Carob*, or Saint John's Bread. The pods, after having been gathered from the tree and dried, are to be thrashed, by beating, or other ordinary process, and the seeds, when sifted, are to be shelled or separated from their husks or skins, by immersing them for about six hours in sulphuric acid, after which the husks or skins will peel and come off by rubbing. The seeds are then to be pulverized, by grinding in a mill, or by beating in a pestle and mortar. The flour of the Carob seeds thus produced, is then ready to be made into a mucilage of a similar kind to the mucilage of gum senegal, starch, or other adhesive matter, usually employed in the mixing of colours for printing linens, woollens, cottons, or silks.

When the seeds have not been perfectly freed from their skins or husks previous to pulverizing them, one pound of the flour must be employed in the place of nine pounds of gum senegal in the usual way; but when the seeds have been perfectly cleared from their skins, then one pound of the flour will be equal to eight pounds of gum senegal. The colours being mixed with the mucilage, will be acted upon by the mordants in the usual way;

but the strength or consistency of the mucilage must be adapted according to circumstances, and can only be known by experience.

[*Inrolled August*, 1823.]

To James Neville, *of New Walk, Shad Thames, Surrey, Civil Engineer, for an improved Method of producing and applying Heat to, and constructing and erecting Furnaces and other Reservoirs, severally used for the various Purposes of Roasting or Smelting Metallic Ores, or other Substances, melting Metals or any other Matter, and for heating Pans or Boilers, or other Substances usually contained in Pans or Boilers, in the various Operations of producing Steam, Distilling, Brewing, Dyeing, Boiling or Baking Sugar, Boiling Soap, or any other Manipulation or Operation, in which the Application of Heat is necessary; and also for the purpose of producing and applying Heat to Furnaces, Pans, Boilers, and Reservoirs already erected and used, or to be used for the Purposes abovementioned; and likewise for effecting a Saving in Fuel, and producing a more complete Combustion of Smoke than at present takes place; as well as a better Mode than any now in use, of collecting and preserving any volatile Substance contained in, or combined with, Metallic Ores, or other Substances, in the Separation of which Heat is necessary; and for the purpose of applying Heat to the Operations of baking or drying Substances in Kilns, Floors or Racks, or in Ovens.*

[Sealed 8th January, 1823.]

The principal feature of this patent is the introduction of a fan-wheel into a part of the flue of a furnace, for the purpose of effecting a partial exhaustion of the air in the flue by the rapid rotation of the fan, and thereby causing a strong current of air to pass by lateral channels through the fuel in combustion, and by that means more completely to consume the smoke than is done by any of the ordinary modes.

Plate X, fig. 2, is a section of the end of a boiler, and its flue, in which *a* is the fan-wheel, revolving upon an axle, at the outer extremity of which a rigger *b* is attached, and over this rigger a band is to be passed from any first mover, for the purpose of giving rotatory motion to the fan-wheel. The chamber, or recess *c c*, in which this fan-wheel acts, is formed something like the shell of a *nautilus*, that is, receding from the centre in a convolute curve, the object of which is, that the air drawn in from the flue *d* at the conical recess in the centre of the fan-wheel, shall be thrown off by centrifugal force.

The fan-wheel is formed by a series of thin metal plates set radiantly from the centre; the shape of these plates will be seen in the section; they are cut in a bevel direction near the axle, for the purpose of producing a conical recess round the axle, and the edges of the plates are fastened by rivets or otherwise to circular plates or rings. That side of the fan-wheel next the flue has a circular opening forming the base of the conical recess, and this opening is circumscribed by a ring which revolves in the end of the flue.

The construction of the furnace is shewn at fig. 3, which is a plan or horizontal section. The fuel introduced at the door *e* is to be pushed backward on to the inclined plane, and is there to remain, gradually decomposing and giving out its gas and vapour, from whence it may be drawn forward by a rake. There are two iron plates *g g* in the cross flues, perforated with conical holes; the under sides of these plates are open to cold air chambers beneath, regulated by sliding doors in front of the furnace, and thereby produce a series of blowpipes, which act upon the fuel in the grate.

The power of a steam-engine, or other first mover, being applied by means of a band to the rigger *b*, the fan-wheel *a* will be made to revolve; and by the centrifugal force which it exerts in revolving, the air in the chamber *c c* will be driven up the chimney, and a partial exhaustion effected in the flues, which will cause the air to rush with great force through the perforated iron plates *g g*, and in passing over the fire will take a thin stratum of smoke and vapour emitted from the coal on the inclined plane *f*, and cause it to be perfectly consumed.

The patentee observes, that this apparatus (the fan-wheel) though not new in itself, having been employed in winnowing machines and various other ways, is nevertheless new in its adaptation to promote the draft of a fire and to consume smoke; the contrivance, therefore, is claimed in all its latitude, when adapted to furnaces for roasting or smelting ores, melting metals, heating boilers, baking or drying on kilns, &c., and to a variety of other operations to which such an apparatus may be usefully applied, whether the said furnaces are already constructed or to be constructed; and the advantages obtained are stated to be a very considerable saving of fuel in the several processes to which it may be adapted; a complete combustion of smoke and other vapour; and a better mode of arresting the volatile particles emitted from the smelting or calcining of ores than has heretofore been employed.

[*Inrolled, July,* 1823.]

To BRYAN DONKIN, *of Great Surry Street, in the County of Surry, Engineer, for his Discovery or Invention of a Means of Destroying or Removing the Fibres from the Thread, whether of Flax, Cotton, Silk, or any other Fibrous Substance, composing the Fabric usually termed Lace-Net, or any other Denomination of Fabric whose Holes or Interstices are formed by such Threads in any of the aforesaid Fabrics.*

[Sealed 11th September, 1823.]

THE great improvement effected in the appearance of lace-net, by removing the downy fibres surrounding the threads of which it is composed, has induced many attempts to accomplish this object, the most effective of which has been passing a flame through the interstices of the lace, and thereby singeing off the loose fibres. In our present volume, page 185, Mr. Hall's mode of singeing lace-net is described, which is done by the flame of a gas burner. The present patentee proposes to accomplish the same object, by passing through the interstices of the lace a current of air heated to ignition.

Plate XI. fig. 2, represents a section of the air passages, and the lace stretched on its carriage, shewing the manner in which the lace is to be operated upon, for the purpose of singeing its loose fibres; *a a* is a wooden frame, having two fixed standards, and one that is moveable; these standards support the rollers *b b* and *d*, over which the piece of lace *c c c* is distended in an endless band or web, the moveable frame, with the roller *d*, may be drawn back, and then made fast by a hook bolt, or any other contrivance, for the purpose of stretching out the length of the piece. Two rollers *f* are placed as guides, between which the lace passes, and each of the rollers are covered with plush, or some such material, for the purpose of taking hold of the lace and carrying it forward, when the rollers are made to revolve. The frame is enabled to advance and recede upon rollers *g g*, for the purpose of introducing the lace-net breadthways between the hot hair chamber *h*, and its chimney, or draft passage *i*.

Below the room in which the singeing is to be performed, a close furnace must be erected, and a blowing machine attached. In this furnace charcoal or coke is to be burnt, when a strong blast being given to the fire by means of the blowing machine, the air which passes through it may be heated to ignition. The flue of the furnace may be carried up as at *k*, through the floor of the singeing room, and then made to turn in a horizontal direction with a wedge-formed chamber, as *h*, extending in length as far as the piece of lace is wide. This chamber, as well as the flue, is formed with fire brick, and bound with iron, leaving a long narrow slit or opening along the top, equal in length to the breadth of the lace which is to pass over it. Immediately over the slit or opening of the flue *h*, is the draft-passage or chimney *i*; this passage is, at its opening, narrow, like the slit of the flue *h*, and of the same length as the slit of the flue, *viz.* equal to the breadth of the lace to be operated upon. The passage *i* converges as it rises in the form of a fan lengthways, and meets at top in the circular tube *j*, which is its chimney or exit pipe.

When the temperature of the air in the flue *h* has been raised by the blowing apparatus to the height of ignition, (which may be known by introducing a few threads at the opening) then the lace may be passed in between the flue *h* and the draft passage *i*, by pushing back the frame *a a* upon its rollers, which will cause the extended web of lace *c*, to enter in a horizontal direction into the long space between the jet of the flue and the draft. The rollers *b b*, *d* and *f*, are now to be put in motion by a winch and band, or otherwise, so as to cause the lace *c*, to pass rapidly over the slit of the flue *h*, at which time the ignited air will be drawn from the flue *h*, through the interstices of the lace and up the draft passage *i*, by which means all the superfluous or loose fibres of the threads, of which the lace-net is woven, will be completely singed off, and the fabric of the net made perfectly clear, and divested of that downy appearance which it has before having been submitted to such singeing process.

The patentee does not confine himself to the particular apparatus herein described, as that apparatus is susceptible of various changes both in form and arrangement; the principle of his invention being the employment of heated air, to be passed through the interstices of such fabric, as may require the singeing process, by whatever means such heated air may be advantageously or conveniently applied to such purposes.

[*Inrolled, November,* 1823.]

To JARVIS BOOT, *of the Town of Nottingham, in the County of Nottingham, Lace Manufacturer, for his Invention of Improved Apparatus to be used in the Process of Singeing Lace, and other Purposes.*

[*Sealed,* 13*th Dec.* 1823.]

THIS invention is a contrivance for singeing lace by means of a spirit lamp, and consists of an apparatus for keeping spirits at a low temperature, when burned in a lamp, for the purpose of singeing lace, and also for a new kind of wick for conducting the spirits from the reservoir to the burner. Plate XI. fig. 2, is a perspective view of the apparatus, which consists of a frame with a pair of guide rollers to conduct the lace, the lamp with its reservoir, and a brush for clearing the lace from any improper matter that might, by accident, adhere to it as it passes over the lamp.

The reservoir *a*, is an urn containing cold water; within this urn is another vessel to be filled with spirits, by means of the funnel inserted into its top; *b* is the condenser into which the spirit flows by the pipe *c*, and having filled the lower compartment of the condenser it rises up perpendicular pipes into the upper compartment immediately under the wicks, by the pressure of the spirits contained in the vessel within the urn *a*, and is retained in the condenser by a stop-cock in the pipe *c*. These parts are all shewn by dots. The wicks *d*, which extend the whole length of the condenser *b*, are made of asbestos, and being at their lower ends inserted into the spirits in the upper compartment of the condenser, they, by capillary attraction, cause the spirit to rise to the top of the burner, and being there set light to, produce a long flame, extending as far as the width of the lace to be operated upon.

The heat of the flame thus produced would soon cause the spirit to take fire in the upper chamber, were it not for the cold water which is admitted from the reservoir *a*, through the pipe *e*, into the condenser, where it surrounds the pipes by which the spirit passes to the burner, and thereby keeps the spirit cool.

The wicks are composed of asbestos, spread between thin silver plates, in pieces of about an inch wide, perforated with many holes, to allow the spirit to flow to the burner: these wicks are inserted into a long slit in the upper side of the condenser, about the thirty-second part of an inch wide, and so constitute the spirit lamp. Both the spirit and the water may be drawn off by cocks, as seen in the view.

The lace or other fabric to be operated upon, must be in lengths, or several pieces may be tacked together, forming an endless web; it is then to be introduced between the rollers *f*, which are made to take out of the frame for that purpose. The rollers, which are covered with fustian, are then made to revolve by means of a winch, and the lace, spread out in breadth by two persons attendant, so as to pass over the flame of the lamp: when the whole length of the lace will by that means be singed, and its loose downy fibres removed without injury to the fabric; the brush *g*, taking off any spark or ignited particle which might by accident adhere, as the fabric passed over the flame. Rollers may be employed to distend the length of lace, but the patentee usually allows it to fall down upon the board or table *h* below.

The specification concludes by saying, "For the better understanding of my improvements, I have described the whole of the machinery used with the horizontal condenser spirit lamp, though to the whole of it I do not claim exclusive right and privilege. But the wick tube to be charged with asbestos, and the spirit condenser, as applied to the purpose aforesaid, being, to the best of my knowledge and belief, entirely new, &c. &c. I claim as my patent right."

[*Inrolled, June,* 1824.]

To **Thomas Hancock,** *of Goswell Mews, in the Parish of St. Lukes, Old Street, in the County of Middlesex, Patent Cork Manufacturer, for an Improvement in the Preparation for various useful Purposes of Pitch and of Tar separately or in union, by admixture of other ingredients with either or both of them.*

[*Sealed, 22d March,* 1823.]

The intention of the patentee is to render ropes, canvas, wood, or other articles, coated with pitch or tar, less pervious to water than they are when coated with those materials as at present employed. In order to effect this object, it is proposed to incorporate with pitch or tar a substance which possesses considerable elasticity, so that when the coating shrinks by cold or otherwise, it may not crack or peel off, and admit water to the rope, canvas, wood, or other substance which it was intended to protect. The elastic material proposed is *Caoutchouc* (Indian rubber), which is to be dissolved in concentrated spirits of turpentine or other spirits, and then mixed up and incorporated with the pitch or tar in a warm state, by which means an elastic, resinous fluid will be obtained, which may be laid upon wood, canvas, ropes, or other material, intended to be protected from damp by a painting brush; or in paying the bottoms of ships, boats, or other vessels with this material, it may be laid on by a trowel or other convenient means; or in making of ropes, the compound may be worked up with the rope as it is manufacturing.

The proportion of these materials one to the other will depend upon circumstances:—viz. the quality of the materials respectively; therefore no decisive rule can be laid down, the prnciple of the invention resting in the combination of the above materials in whatever way they may be conveniently incorporated together for the above purpose.

[*Inrolled, September,* 1823.]

To Robert Mushet, *of the Royal Mint, Tower Hill, in the County of Middlesex, Gentleman, for a Mean or Means, Process or Processes, for Improving the Quality of Copper and Alloyed Copper, applicable to the Sheathing of Ships and other Purposes.*

[*Sealed,* 14*th June,* 1823.]

It has long been considered that the cause of that destructive action which sea water has upon the copper sheathing of ships, is attributable to the impurity of the copper employed, that is, to the mixture or alloy of copper with other metals. The patentee appears to consider that this destructive effect arises more from the quantity of alloy, and its particular character, than from the mere circumstance of the copper being impure; for he has discovered that pure or refined copper is not so tenacious as when mixed with alloy in certain proportions.

With this view he purposes, in order to increase the tenacity of copper, to mix with it, as an alloy, regulus of zinc, in the proportion of two ounces of zinc to one hundred pounds weight of copper; or two ounces of block or grain tin; or four ounces of regulus of antimony; or eight ounces of regulus of arsenic, in the same quantity of copper. Or instead of employing these substances alone in the proportions above stated to one hundred weight of copper, he proposes to add half an ounce of regulus of zinc, half an ounce of grain or block tin, one ounce of regulus of antimony, and two ounces of regulus of arsenic.

This alloy, or any other admixture of these alloys, in the proportions stated, will render the copper more tenacious than in its pure state and of a fibrous quality. The patentee does not confine himself, in mixing these alloys with the copper, to any particular part of the process of preparing copper from the ore, but states, that the alloys are very apt to fly off in vapour, and directs that an assay shall be always made of the metal after mixing, in order to ascertain its quality. He observes that brass and other alloys of copper are well known, therefore he does not claim as his invention the alloying of copper with the metals stated; but he claims the adding to or taking from copper such quantities of other metals, as shall bring the alloy of copper to the proportion above expressed, which will prevent the corrosive effects of the sea water upon the copper bottoms of ships, &c.

[*Inrolled, December*, 1823.]

To John Good, *of Tottenham, in the County of Middlesex, Engineer, for his Invention of certain Improvements in Machinery, Tools, or Apparatus for Boring the Earth, for the Purpose of obtaining and raising Water.*

[Sealed, 20th August, 1823.]

In our sixth volume, page 145, we gave a particular account of the novel and important practice of boring the earth for water, by which means springs are discovered, and water raised from a considerable depth, at a very trifling expence compared to the ordinary process of well-digging.

The present patentee has been extensively employed in this business of boring the earth for water; and the implements which form the subject of this patent are such as, in addition to those we have before described, are found to be necessary or useful under different circumstances in the progress of that business; our readers will therefore perceive the advantage of these improved implements in a more forcible way, by first running over the previous account (which we have given with considerable exactness,) of the whole of the process of boring, and the tools then employed.

Plate X. exhibits the newly-invented implements; fig. 4 is an auger, to be connected by the screw-head to the length of rods by which the boring is carried on. This auger is for boring in soft clay or sand; it is cylindrical, and has a slit or opening from end to end, and a bit or cutting-piece at bottom. When the earth is loose or wet, an auger of the same form is to be employed, but with the slit or opening reduced in width, or even without a slit or opening. A similar auger is used for cutting through chalk, but the point or bit at bottom should then project lower, and for that purpose some of these cylindrical augers are made with moveable bits, to be attached by screws, which is extremely desirable in grinding them to cutting edges. Fig. 5 is a hollow conical auger for boring loose sandy soils; it has a spiral cutting edge coiled round it, which, as it turns, causes the loose soil to ascend up the inclined plane and deposit itself in the hollow within. Fig. 6 is a hollow cylinder or tube, shewn in section, with a foot valve, and a bucket to be raised by a rod and cord attached at top; this is a pumping tool for the purpose of getting up water and sand that would not rise by the auger. When this cylinder is lowered to the bottom of the bore the bucket is lifted up by the rod and cord, and descends again by its own gravity, having a valve in the bucket opening upwards like other lift pumps, which at every stroke raises a quantity of water and sand in the cylinder equal to the stroke, the ascent and descent of the bucket being limited by a guide-piece at the top of the cylinder, and two small nobs upon the rod, which stop against the cross-guide. Fig. 7, is a tool for getting up broken rods, it consists of a small cylindrical piece at bottom, which the broken rod slips through, when it is lower, and a small catch with a knife-edge, acted upon by a back-spring. In rising, the too, takes hold of the broken rod, and thereby enables the workmen at top to draw it up. Another tool for the same purpose is shewn at fig. 8, which is like a pair of tongues; it is intended to be slidden down the bore, and for the broken rod to pass between the two catches, which pressed by back-springs, will, when drawn up, take fast hold of the broken rod.

Fig. 9 is a tool for widening the hole, to be connected, like all the others, to the end of the length of rods passed down the bore; this tool has two cutting-pieces extending on the sides at bottom, by which, as the tool is turned round in the bore, the earth is peeled away. Fig. 10 is a chisel, or punch, with a projecting piece to be used for penetrating through stone; this chisel is by rising and falling made to peck the stone and pulverize it; the small middle part breaking it away first, and afterwards the broad part coming into action. Fig. 11 is another chisel, or punching tool, twisted on its cutting edge, which breaks away a greater portion of the stone as it beats against it.

The manner of forcing down lengths of cast iron pipe, after the bore is formed, is shewn at fig. 12; *a* is the pipe in the socket, at the end of which a block *b*, is inserted and from this block a rod *c*, extends upwards, upon which a weight *d*, slides. To the weight *d*, cords are attached, reaching to the top of the bore, where the workmen alternately raises the weight and lets it fall, which by striking upon the block *b*, beats down the pipe by a succession of strokes; and when one length of pipe has by these means been forced down, another length is introduced into the socket of the former. Another tool for the same purpose is shewn at fig. 13, which is formed like an acorn, the raised part of the aeorn strikes against the edge of the pipe, and by that means it is forced down the bore. When it happens that an auger breaks in the hole, a tool similar to that shewn at fig. 14 is introduced; on one side of this tool a curved piece is attached, for the purpose of a guide to conduct it past the cylindrical auger, and at the end of the other side is a hook, which taking hold of the bottom edge of the auger, enables it to be drawn up.

Wrought iron, copper, tin, and lead pipes, are occasionally used for lining the bore; and as these are subject to bends and bruises, it is necessary to introduce tools for the purpose of straightening their sides. One of these tools is shown at fig. 15, which is a bow, and is to be passed down the inside of the pipe, in order to press out any dents. Another tool for the same purpose is shewn at fig. 16, which is a double bow, and may be turned round in the pipe for the purpose of straightening it all the way down. Fig. 17 is a pair of clams, for turning the pipe round in the hole while driving.

When loose stones lay at the bottom of the hole, which are too large to be brought up by the cylindrical auger, and cannot be conveniently broken, then it is proposed to introduce a triangular claw, as fig. 18, the internal notches of which take hold of the stone, and as the tool rises brings it up. For raising broken rods a tool like fig. 19 is sometimes employed, which has an angular claw that slips under the shoulder of the rod, and holds it fast while drawing up.

In raising pipes, it is necessary to introduce a tool to the inside of the pipe, by which it will be held fast. Fig. 20 is a pine-apple tool for this purpose, its surface is cut like a rasp, which passes easily down into the pipe but catches as it is drawn up, and by that means brings the pipe with it. Fig. 21 is a spear for the same purpose, which easily enters the pipe by springing, at the ends of its prongs there are forks which stick into the metal as it is drawn up, and thereby raise it.

These are the new implements for which the patent is granted; in the process of boring there does not appear to be any thing new proposed, but that these several tools are to be employed for boring, pecking, and otherwise penetrating, raising the earth, and extracting broken or injured tools. There are also suggestions for employing long buckets with valves opening upward in their bottoms, for the purpose of drawing water from these wells when the water will not flow over the surface; also lift pumps, with a succession of buckets for the same purpose; but as these suggestions possess little if any novelty, it cannot be intended to claim them as parts of the patent.

[*Inrolled, October,* 1823.]

To JOHN VALLANCE, *of Brighton, in the County of Sussex, Esq. for his Invention of an Improved Method of Freezing Water.*

[Sealed, 1st January, 1824.]

THE patentee states it has long been known that evaporation carries off heat from liquors, and that Dr. Cullen discovered, in 1755, that removing the pressure of the air facilitated evaporation so as to enable him to freeze water in summer. Mr. Nairne also discovered, in 1777, that introducing sulphuric acid into an exhausted receiver absorbed the aqueous vapour from rarefied air; and by an arrangement of these principles, and a mode by which the vapour that rose above the surface of the water was removed, Professor Leslie, in 1810, succeeded in freezing a quantity of water, about one pound and a half in weight, though he could not effect the congelation in larger quantities.

The method herein proposed for freezing water consists in combining the foregoing principles with a plan of the patentee's, by which water in very large quantities may be frozen. This plan is, to pass a current of dry rarefied air over the extended surface of the water, which, by impinging upon it, carries off the aqueous vapours. In order to produce a large evaporable surface, the water is to be placed in a broad flat-bottomed vessel, just spreading over it in a stratum of about half an inch deep—such a vessel is represented in plate XI, at *a a*, fig. 4. From this vessel the greater part of the air is to be removed through the pipe *b*, by means of two powerful air-pumps, until the pressure of the air within will only support about one inch of mercury. A current of dry atmospheric air is then made to pass over the surface of the water at bottom by the following means:—

A hollow tube *c* passes through a stuffing-box in the lid of the vessel *a*, where it is enabled to slide up and down, and has at its bottom a circular plate or disc *d*, rising a little conically in the middle, which plate is brought down to within half an inch of the water. At the upper end of the tube *c* another similar tube *e* is attached by flanges, and this passes through a stuffing-box in the upper vessel *f*. From this upper vessel a bent pipe *g* conducts into another vessel *h*, which has a small opening at bottom to admit air, and is nearly filled with leaden bullets. Upon these bullets a quantity of sulphuric acid is occasionally poured for the purpose of wetting their surface, and in this state the apparatus is ready for action, observing that several holes are made in the lid of the vessel *a*, and also in the plate *d*, and closed air-tight with glass, for the purpose of observing the progress of the operation within.

The air-pumps, which are to be of large construction, are proposed to be immersed in water to render their joints air-tight, and when put in action will draw the air from the vessel *a*. The stop-cock in the bent pipe *g* is now to be partly opened, so as to admit air in the same proportion as the pumps exhaust it. The air thus admitted passes through the circuitous ways between the leaden balls in the vessel *h*, and in so passing is deprived of its aqueous parts by the absorbent properties of the sulphuric acid. A current of dry air is thus made to proceed from the vessel *h* through the pipe *g*, the vessel *f*, the tubes *e* and *c*, and to descend upon the surface of the water under the disc or plate *d*, in the vessel *a*, which current of air being drawn off by the air-pumps through the pipe *b*, carries with it the caloric of the water, and causes it to congeal into ice.

One stratum of water being thus congealed, a similar quantity is to be again introduced into the vessel *a*, flowing upon the said ice about half an inch deep, and by a similar operation of the pumps this will be congealed also; which processes may be carried on successively until the vessel is filled with ice, when the mass may be removed and broken up for use; several other modes of absorbing the moisture of the atmosphere are proposed, such as exposing dry substances, instead of using the sulphuric acid.

Thus by a combination of the principles discovered by the above experimentalists, the patentee effects the freezing of water in any quantity, and the apparatus described is only to be considered as a familiar illustration of his intended mode of operating, without in any degree being proposed as a perfectly constructed piece of machinery.

[*Inrolled*, *June*, 1824.]

Original Communications.

To the Editor of the London Journal of Arts.

Sir,

A leisure half hour induces me to trouble you with a few observations on a subject which has recently excited considerable attention,—I mean the establishment of public and joint stock companies, not as to those, such as Insurance Mexican Mine and similar companies, which from their very nature must be public, no private capital being adequate to their purposes, but in so far as relates to joint stock companies for the manufacturing and vending of articles of necessity or daily consumption, or of otherwise coming in competition with the individual and private trader. Of the former description, besides Insurance and Mining Companies already mentioned, are the various new establishments for conveying sea-water to London; for supplying the metropolis with pure spring or river water at reduced rates; for lighting it with oil and coal gas; and others *ad infinitum*, administering to the luxuries, or contributing to the comforts of its inhabitants; in the latter class will be found principally the Reversionary Interest Society, the schemes for Equitable Loan Banks in England and Ireland, and the projected Union Bread and Flour Company.* With what may be termed *The Essentially Public Establishments*, neither I nor you, Sir, nor the public generally, have any concern; they may flourish, or may fade, without affecting any persons but the shareholders, and rival companies; but with the others the case is different; they have been complained of as infringements on private right, and it may be worth while to examine whether any grounds for such complaints really exist. The Reversionary Interest Society in the first place, may be put entirely out of the question; for whatever injury may result from it falls upon a class of men whom no one can sympathize with—professed money-lenders, and usurious bill-brokers. The Equitable Loan Banks may also pass without comment; first, because the schemes are relinquished, next, because the advantage which they held out to the poor in enabling them to obtain small loans of money at 10 instead of 20 per cent. are sufficiently obvious. The proposed Bread and Flour Company then is all that demands notice, and the subject is too interesting to require apology. On commencing, I beg to express myself a warm advocate for the utility of the plan; and my reasons for being so, I will set out as concisely as possible. In the first place, the general adulteration of bread by the London bakers is a fact established beyond dispute, by chemical analysis, and by the innumerable convictions which are continually taking place for that offence. Now I assume it for granted, that in an establishment of such magnitude as the projected one in question, this adulteration could not be practised without almost inevitable discovery. This I take it affords good grounds of proof as to what we may expect will be the quality of the bread; as to its cheapness, the circumstance of each subscriber of twenty shillings taking his household bread from the company weekly (so that, in fact, the profits of the undertaking will be applied in the reduction of the price of the article) and the probable establishment of rival companies will always ensure the public good bread at a just and reasonable price. These are positive advantages; as to its disadvantages, I think no one will venture to deny that no proposition in social economy can be more true, than that partial evil is general good; and if the poor can by means of this company obtain their loaf a penny cheaper or better in quality, then I say away with the baker, and the huge wicker nuisances which grace their backs to the annoyance of his majesty's lieges, and let their capital and industry be turned into fresh channels. I think it needless, Mr. Editor, to say a word on the observations which were recently made on this subject at the Mansion House, since the time has long gone by, if indeed it ever existed, when the dictum of a Mayor of London was heeded by any rational man. I shall only observe in conclusion, that if the advantages of the proposed plan be thought at all problematical, as I flatter myself they will not even on my humble shewing, the person who is inclined to doubt, cannot but have his doubts removed by the note in the margin, from which it appears that the plan has been weighed anddecided on in a court of justice, and before judges whose opinions are really to be listened to with respect.

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* Two Union Flour and Bread Companies have long been established in Birmingham, much to the advantage and satisfaction of the inhabitants of that populous town. An indictment was preferred against one of them by some interested parties, for infringing on the rights of numbers of the king's subjects in their trade and commerce; but on the trial, the jury found specially, that *the Company was instituted from laudable motives, and for the purpose of more regularly supplying the town of Birmingham, and the neighbourhood, with Flour and Bread, and that the same was originally and still is beneficical to the inhabitants at large.* The Court gave judgment *for the Defendant.*

I am fearful of trespassing too much on your time and space, or I should have entered more largely into the question. My definition of the two descriptions of companies is not very perspicuous, and perhaps it would have been better for me to have classed the former into those for the general benefit of the community, such as the Mining Establishments, and those which beside having this object, tend to the advancement of science, such as the Steam Vessel Companies, and others. The establishment of these is beyond the power of private capital; the Steam Washing Company, however, though of equal utility, is merely the private business of several individuals, and of course does not come within the scope of these observations.

I rely on your impartiality to insert this; I have no concern with the Flour Bread Company, nor do I know a single individual who has; but I am an enemy to monopoly, and bad bread and bakers' baskets.

Your humble servant, H.

FRENCH PATENTS

Granted in 1823.

To *Mons. F. Achard, sen.* and *P. Audet,* LYONS, for men's and women's hats in plush silk or cotton, mounted on pasteboard, leather, or cloth, water-proof or not.

To —— *F. L. Allamand,* PARIS, for a process which prevents articles of iron and steel from oxydation, by the application of a prepared metallic coating, which gives to them the colour of platina.

To —— *J. J. Allard,* PARIS, for a movement called Thermique Balance.

To —— *N. Appert,* PARIS, for a process for melting tallow.

To —— *J. Badnall,* PARIS, for a process for dyeing colours, by a peculiar manner of mixing Prussian blue.

To ———— for a machine for throwing and doubling silk, and every other filamentary substance.

To ———— for machines, preparations, and processes, for saving time, materials, and labour, in the tanning of hides and skins of all kinds, by forcing the tanning liquor over them by means of pressure.

To —— *Th. J. Banse,* LYONS, for an application of the gauffrure on stuffs or ribbons wove in raw silk, whether milled or not, and the mode of preserving the effect produced by the action of the gauffrure.

To —— *J. Barbier,* MONTELIMART; for a tour for spinning silk.

To —— *L. J. Battaille,* PARIS, for a grafting knife and a pruning knife, with a hammer for grafting and cutting trees.

To *Mons. Bellargent*, PARIS, for a method of reviving old plaister to make it look like new.

To *Madame Benoist*, PARIS, for seats of easement without smell.

To *Mons. N. W. Berger*, PARIS, for different forms of black lead crayons, in wood or metal cases.

To —— *A. A. Bergouhnioux*, CLERMONT, for a preparation for taking out the colour of syrup, and making printing ink.

To ———— three patents for improvements upon the preceding patent; *viz.* 1st. For revivingthe black proceeding from woods, earths, bituminous sands, &c. which have already been made use of for taking out the colour and clearing sugar, and obtaining, by the distillation of the same substances, a fat substance, and a charbon susceptible of divers applications in the arts. 2nd. To extract from them a gas which may be employed in lighting of workshops, and warming generally. 3d. To apply the specific black in the first patent to several uses, such as the making of crayons, gunpowder, &c.

To —— *B. L. Berthault*, PARIS, for articulated or elastic wooden shoes.

To —— *J. C. Blouet*, MONT ST. MICHEL, for a mode of platting on the wrong side, for bonnets in ozier twigs, whalebone, &c.

To —— *P. F. D. Boinet and Marschall*, PARIS, for a new kind of stockings, called garter stockings.

To —— *Et. Boisset*, PARIS, for an oven to charbonise wood and turf, and purify coals.

To —— *C. Bonnard*, LYONS, for a machine to spin silk, by drawing it from the cod of the silk worm, one part for the improvement of the silk *grèzè ordinaire*, and the other for the spinning and preparing that in the woof by the same operation.

To *Mons. M. A. Boullay,* PARIS, for an improved mode of making razors.

To —— *J. Brèmon,* PARIS, for apparatus for removing and heating private baths.

To —— *L. V. Brouet and J. Clement,* PARIS, for a peg to tighten the strings, and preserve in tune violins and guitars.

To —— *A. Capplet and P. H. Sebe,* ELBEUF, for alkaline tubs to purify hot or cold alkaline baths which have been rejected, and to make them as good as new.

To —— *L. Carette,* LILLE, for portable lanthorns with moveable cylinders, with which any person may go without fear of fire, into places containing inflammable substances.

To —— *L. Carpentier,* LILLE, for a kettle to make oxygenated muriatic acid, or a liquor to bleach cloth and cotton.

To —— *J. B Cartier,* PARIS, for a machine to card wool for mattrasses.

To —— *P. Champagnat,* PARIS, for a varnish for morocco, and sheep skins of all colours.

To —— *L. V. Chevalier,* PARIS, for a camera obscura, in which the place of the lenses and mirrors is supplied by a triangular prism, the superfice of which is smooth and bent, called Prism Monisque.

To *Madame Chevalier,* PARIS, and *J. B. Bouron,* for a tooth powder.

To —— *M. Chevenier,* LYONS, for a machine for making nails, called Pointes de Paris, having their points in the form of a blade, by which 6000 can be manufactured in an hour.

To —— *J. Collier,* PARIS, for an apparatus to feed with coals and other combustibles, steam engines.

To *Mons. F. Collier* for a hand-mill for grinding grain, &c

To ——— for a machine to weave cloth and other materials.

To —— *G. Danre*, LA HAVRE, for a steam boat to carry shell-fish from Cancale, St. Maloes, &c.

To —— *L. N. Debergue and V. S. Dubois*, PARIS, for a mode of propelling vessels and boats on rivers, by means of a screw of Archimedes placed horizontally, and put into motion by a steam engine, or any other force.

To —— *L. A. Delangre*, PARIS, for a covering for the leg, called Chaussure Anticrotte.

To —— *L. J. Deleuil*, PARIS, for an instrument called Scarificature, to prevent the application of leeches.

To —— *Despiau, sen.* BOURDEAUX, for a machine for weaving all kinds of stuff.

To —— *L. P. Devoulx*, MARSEILLES, for a machine to cut glue.

To —— *F. Didot*, PARIS, for geographical maps, executed on plates, engraved in relief.

To —— *T. Dory*, PARIS, for a machine for washing the cinders in melting gold and silver.

To —— *J. Ducros*, CHATANNEUF, for an improved wine press.

To —— *J. F. Dufaget*, PARIS, for a matrix proper for moulds, such as statues, bas reliefs, cornices, &c.

To —— *J. Dumuret* and *H. Brunett*, ST. ETIENNE, for an economical machine for making lace, &c.

To —— *P. Dumoutier and M. Alland.* PARIS, for a composition of lime to be used in making canals, basins, reservoirs, &c.

To *Madame Dutillet*, PARIS, for a process for the composition of factitious marble.

To *Mons. J. Eaton and H. Farey*, PARIS, for a machine which prepares for spinning cotton upon Mules and Jeniens.

To *Mons. G. Engel*, TOSSEY, for a cylindrical brush to clean the teasles used in the dressing woollen cloths.

To —— *L. Escax*, PARIS, for a syphon to draw off liquors without a breath tube.

To *Le Baron d'Etchegoyen de*, MULDER, PARIS, for a machine to prepare silk.

To *Mons. C. F. Favre*, PARIS, for making purses of gold and silver silk, &c. plain and ornamental.

To —— *L. B. Fourmand*, NANTES, for making iron cables.

To —— *Fathon*, PARIS, for a process relative to silver and gilt borders.

To —— *Gannet and Co.*, PARIS, for a new composition for boots and shoes.

To —— *J. C.Gotten*, for a leg clothing called Claque.

To —— *A. Garnier*, PARIS, for a mode of regulating the consumption of inflammable gas used in lighting.

To —— *I. F. Gansoul*, LYONS, for a steam apparatus for spinning the pods of silk worms.

To —— *Goujon and Bonnand*, LYONS, for a new fabrication of silk velvet.

To —— *Grandjean*, PARIS, for a moveable oar with three manœuvres.

To —— *A. A. Gueroult*, PARIS, for a system of oars moving in a vertical direction, applicable to the navigation of steam boats.

To —— *A. Guibout*, PARIS, for a means of preparing fancy silks.

To —— *M. F. Guilloit*, PARIS, for a moveable furnace with a falling cover to charbonise turf for fuel.

To —— *F. L. Guizot*, PARIS, for a crane applicable to clearing canals from dirt, and to remove the earth of the works of fortifications.

To *Mons. P. Humbert*, PARIS, for a crystal lamp called the Vase Lumineux.

To —— *J. P. Hucks*, PARIS, for a machine to make wood moulds, and to prepare them for gilding for glass and picture frames, and for the decoration of rooms.

To —— *L. A. J. Hallette*, ARRAS, for a travelling steam engine.

To —— *S. Hall*, PARIS, for a machine to singe off the fibres of linen, cotton, silk, and lace threads, &c.

To —— *Th. Hallam*, PARIS, for a process to purify and bleach rice, so that it may be employed as a substitute for starch.

To ————, for a machine to twist and double at the same time, all sorts of filamentary substances.

To —— *L. C. Halle*, PARIS, for a new frame or loom to *decatissage* cloths and stuffs.

To —— *J. Hanchett*, VERSAILLES, for an application of the reactive power of water, to put in motion boats and vessels of all kinds.

To ———— *and H. G. Smith*, for a machine to convey gas.

To —— *A. Haton*, PARIS, for a steam and boiling kettle, calculated to serve as an hydraulic stove to warm large green houses.

To ————, for a mechanical table for the execution of panoramas, dioramas, cosmoramas, &c.

To ————, for an economical chimney, called Augustine, in which the heat is thrown down, and a sucker with the usual tunnel and *extensible* with a double current of air.

To ————, for a green house and a permanent bed for plants, which is called *Calorique Ignee,* or miraculous bed.

To *Mons. GeorgeHeath,* PARIS, for a method of keeping a boiler always full of water, by condensing the steam.

To —— *J. C. Hacquettè d'Orval,* ABBEVILLE, for the improvement of a stuff known by the name of moquette.

To —— *Helligenstein,* PARIS, for sugar moulds and syrup pots, for the use of sugar bakers.

To —— *P. P. Henry,* PARIS, for the fabrication of a stuff resembling tapestry to cover furniture.

To —— *Th. Holland,* PARIS, for a new system of wheels.

To —— *J. B. Hubert,* ROCHEFORT, for a system of moving *albes,* by means of which may be given at any time all the combinations of movement, transition, and rotation to ships, and of dispensing with the use of the rudder.

To —— *F. M. Jacquemin,* GUEBWILLER, for a hand mill, that will reduce corn into meal not sifted from the bran, thirty killogrammes of grain in an hour.

To —— *U. Jeandeau,* CHALONS, for the application of a vapour machine to the movement of *iron usine,* so as to keep them constantly growing.

To —— *P. Jernestedt,* PARIS, for a means of preserving, in great quantities and in families, meat, fish, fowl, vegetables, &c.

To —— *Dubois, Jolin and Dumont,* NANTES, for a mode of clarifying and filtrating sugars.

To —— *A. Jourdan,* GANGES, for a means of making boats to go against the most rapid currents without the assistance of drawing, or a steam engine.

To ——. *Koutzer, Brothers,* BELLEVILLE, for a flexible under leg dress, called flexile subocalèe.

To *Madame Latourette*, PARIS, for a small *easier*, called arguphule, to separate and make known *la mise au jeu* of gamesters.

To *Mons. J. Lavigne*, BOURDEAUX, for a new process vinificateur.

To —— *W. Lee*, PARIS, for a mechanical apparatus for printing.

To —— *J. V. Lefevre*, PARIS, for an economical furnace.

To —— *L. Lefort*, PARIS, for public washing houses.

To —— *V. J. Lefran*, COLMAR, for a series of porte crayons.

To —— *J. C. L. Leubel*, PARIS, for machines for making mould and wax candles.

To *Messrs. L. E. Lantein and I. B. Guenet*, RHEIMS, for a regulator to improve the spinning of carded wool.

To *Mons. L. V. Lantelme*, AIX, for an apparatus for distilling wines, brandy, and other spirits, by two distinct operations.

To —— *L. Lassieux*, PARIS, for a chronometer that counts minutes, seconds, and their fractions, improved and generalized in its applications.

To —— *P. Leblanc*, TOURS, for a machine for making china and earthenware, and the preparation of the earth designed for those uses.

To —— *L. D. Lecour*, PARIS, for a process to convert instantly mineral iron into *doux* iron, without charcoal.

To —— *M. P. Lecouturier de Courcy*, PARIS, for a chimney, called fumi calorique, adapted to all chimneys, is economical, and prevents smoke in the apartment.

To —— *W. Lee*, PARIS, for a gun which may be fired off many times successively, after having been once charged.

To —— *P. H. Lefaure*, PARIS, for a gun-lock adapted to all sorts of fire arms, and that primes itself with fulminating powder.

To *Mons. I. T. Lèorier*, TONNERRE, for the application of an oblique wheel to divers kinds of mechanism.

To —— *B. C. Leroy*, PARIS, for a clock or pendulum, raising itself by the force of the air.

To —— *E. Magnan*, PARIS, for a machine to prepare for warping.

To —— *D. C. Magnien*, PARIS, for a portable instrument, which serves with its *billot* to attach horses in such a manner as prevents them wounding or entangling themselves.

To —— *Mariet, Jun.* CHINON, for a machine adapted to the cock plate of a percussion gun.

To *Mademoiselle Monceau*, PARIS, for a *tissue* of silk, in imitation of Italian straw, adapted to the *confection* of men and women's hats.

To *Messrs. D. Martin, and J. Dumas*, LASALLE, for an economical mode of heating ovens with coals.

To *Mons. I. B. Masson*, ROUEN, for a means of preventing brass stoves from losing their brilliancy by the action of fire.

To —— *F. Menestrel*, ARLES, for an hydraulic lever to water extensive grounds with, and which may also be applied to other purposes.

To —— *I. Mestrallet*, LYONS, for a wire drawing plate, to obtain in all proportions of size, gold, silver, and silver gilt wire.

To —— *L. Molinië*, SAINT PONS, for a means of improving the *drousses* and cards for working wool and cotton.

To —— *A Naquet*, PARIS, for the composition of a paste called rouge vert d'Athènes, for the toilets of ladies

To *Mons. I. F. Noyons*, VILLE DIEU, for a machine for piercing sieves, *grenoirs*, and lace cards of all sorts.

To —— *B. Negro, and I. Tourneaux*, PARIS, for a means of fabricating a stuff proper for making stocks for the neck.

To—— *H. Oxley*, PARIS, for a wool spun in such a manner as to fit it for woollen crapes.

To —— *Petou, Brothers and Son*, LOUVIERS, for a stuff called summer cloth.

To —— *T. Pignant*, PREMIERES, for a machine to *refouler*, and beat again the carreaux, called rebattoir mecanique.

To —— *S. Parker*, PARIS, for a statique lamp.

To —— *P. Pillard, sen.* SAINT PERRES LES TERTRES, for a mover adapted to all machines which are moved by force.

To —— *B. Peyroche*, PARIS, for a contrivance to turn leaves adapted to choristers' desks, pianos, &c.

To —— *A. Picquet*, PARIS, for a process for conveying and placing in houses hydrogen gas.

To —— *L. F. Ranque*, ORLEANS, for a substance which enriches lands, and preserves cattle from *meteorization.*

To —— *J. Roller*, PARIS, for a metal covering for pianos.

To —— *I. M. Rouy*, PARIS, for squares of earth prepared for apartments.

To —— *D. Rees*, PARIS, for ovens for the casting and working iron, and a process for working wrought iron with cast iron.

To *Mons. A. Regnard*, LYONS, for an elastic bed.

To —— *Revillio, jun.* LYONS, for a process for making stuff for furniture, called taffetas diaphane.

To —— *Rodier, jun.* NISMES, for an hydraulic mover that adapts itself to every mechanical process requiring motion.

To *Messrs. Revon and Moulinèe*, PARIS, for a steam engine, adapted to carriages of all sorts, and boats of all dimensions.

To *Mons. Thos. Rogers*, PARIS, for an elastic strap, which goes under the foot, for pantaloons and gaiters.

To ——— for moveable eyelet holes for corsets, and instruments for fixing them.

To ——*B. Rotch*, PARIS, for a moveable key for the manœuvres of the scuttle of a mast, and for the top gallant mast of ships of every tonnage.

To —— *I. B. Rouan*, PARIS, for a machine called rouanettes salvanat, to preserve swimmers from drowning.

To —— *L. R. Rouyer*, PARIS, for the fabrication of artificial pearls.

To —— *H Roux*, PARIS, for additions and improvements to the gun called fusils de pauly.

To —— *Saint Cricq Cazeaux*, CREIL, for an economical process for baking porcelain, earthen ware, pipe clay, and other earths; also for making bricks, tiles, &c. in a cylindrical, or elliptical oven, or any other form.

To —— *C. De Saint Jorre*, PARIS, for an apparatus called jorrine or conservateur de chateur, to keep dishes hot for the table,

To —— *F. Sauvage*, BOULOGNE, for a machine to saw marble by means of wind.

To —— *I. B. Schwilgue*, SCHLESTAFF, for a balance to weigh loaded carriages.

To —— *I. Testier, and G. H. Delavigne*, NANTES, for an hydraulic machine called pompe aspirante foulant, a continued rotation.

To —— *Ch. Taulet*, PARIS, for an economical and speedy mode of purifying tallow, and making candles.

To *Mons. J. Taurine, sen.* ELBEUF, for a machine to shear cloth.

To —— *J. Thomas*, PARIS, for a new means of working plate, and bar iron.

To —— *J. L.'A. Trefcons*, PARIS, for mechanism to make wicks for lamps rise and fall, by a double current of air.

To —— *P. F. Toussaint*, PARIS, for a key with its accessories, with a double key bit, for the security of locks, padlocks, &c.

To —— *I. B. Trimarche, and B. Morand*, PARIS, for an apparatus for removing smells from water-closets, &c.

To —— *I. F. Vernet, and I. C. Gotten*, PARIS, for a crystallized paste, which forms reflection for lamps, lanthorns, &c.

To *Mons. I. F. Vourloud*, LYONS, for the composition of Eau de Cologne.

To —— *L. Wolf*, STRASBOURG, for a cylindrical tour of hair, with perpetual curl.

Novel Inventions.

A discovery of a new mode of preparing hemp and flax without steeping, by means of a machine called *La Broie Mecanique Rurale*, invented by M. Laforest, has been lately presented to the Royal Academy of Sciences, at Paris.

The memoir states, that much attention has been engaged in the discovery of the best means of separating the filaments of these two textile plants from the tenacious envelope which nature has given them The object to be obtained is this separation, without having recourse to *rouissage*, or steeping the plants in water, this having been found injurious to health, by its effect on the surrounding atmosphere.

and having a tendency to injure the substance of the fibres. What is sought, is a mode of separating the gum, with which the plant is enveloped, without wetting it, as the particles of this gum falling into water, produce a pestilential fermentation. It has been considered that by preparing the material in a dry state, the filaments will not be much broken nor their strength diminished, and yet completely freed from the gum; but this mode, in one way or other, has been hitherto attended with so many difficulties, that, previous to the present discovery, it had been abandoned in France. Many attempts have been made by mechanics and chemists, in different periods and countries, to obviate these difficulties, all of which have failed, either as being too expensive, or having, upon experiment, been found not to answer the expectations of the inventors.

La Société d'Encouragement proposed a prize of six hundred francs to any one who should discover a method, simple and efficacious, of preserving the quality of the hemp and flax, and at no greater price than the ordinary mode of steeping. M. Laforest, who has brought forward *La Broie Mecanique Rurale*, takes the flax and hemp at the moment of their maturity, and performs their most perfect desiccation; without any immersion he works upon them in their rough state, till they are fit to be given to the spinners. This machine successively and almost simultaneously shakes out the seed, softens it, bruises it, disengages it from the gum, and dresses the flax and hemp, while the clearing from the gum, which is completely effected by this process, is of the greatest importance, as its being suffered to remain, injures the material. It is necessary in doing this not to remove an unctuous and oily substance, which nourishes and gives tenacity to the thread, and insures the procuring long pieces. There is but one mode by which this essential vegetable glue can be preserved, without which there will be produced many coarse parts, or a kind of downy filament without consistence or use, and this is completely effected by the machine. The commission appointed by the Academy, after examination of the hemp and flax prepared by this machine, and those prepared by the ordinary mode, both as respects quantity and quality, declared that the machine produces it with less of the coarser parts, that the threads are more numerous, softer, and clearer, of a better colour, finer to the touch, and of a quality rarely met with in those which have not been steeped; the hemp and flax are prepared at less expense, the machine is simple, and easily worked by women and children; but the commissioners who have witnessed its operation, though they say the secret is discovered, by one word only, have solemnly promised not to divulge it.

The inventor proposes to open a subscription for a *modele en relief.*

Query—Are the French acquainted with Mr. Bundy's late patent invention for a similar object?—See the present volume, page 113.

Ed.

Polytechnic and Scientific Intelligence.

LONDON MECHANICS' INSTITUTE.

THIS new Institution appears to be proceeding in a way that promises great usefulness among the working class of mechanics in London. Their lectures, which usually take place twice a week, are attended by very numerous and attentive audiences, at the chapel in Monkwell Street, Moorgate; and a commodious theatre is about to be erected, contiguous to their newly engaged premises, in Southampton Buildings, Chancery Lane, which is intended to accommodate nearly a thousand persons.

CITY PHILOSOPHICAL SOCIETY, REMOVED FROM DORSET STREET, SALISBURY SQUARE, TO HOLBORN BARS.

WE have before mentioned this society as possessing advantages which the young philosopher would do well to embrace; besides the lectures on various branches of science and literature, to which the members are enabled to admit their friends, the private philosophical discussions, and scientific *conversations*, in which all the members partake, are particularly calculated to improve the mind, enlarge its views, and form just impressions not easily forgotten.

The following is a circular issued upon their removal to their new premises ;—

" This Society was instituted in the year 1808, by a few individuals attached to *philosophical* and *literary pursuits*, who hoped by the interchange of ideas and the collision of opinions, to promote inquiry and advance the cause of truth.

" During the sixteen years the society has been established, a library, consisting of many of the best works on philosophy and the arts, has been formed; and gratuitous lectures, on almost every branch of human knowledge, have been delivered to the members and their friends.

" The lectures and discussions have been the means of calling forth talent which, without such opportunities, might ever have remained dormant; and the members cannot but reflect with gratulation, that from this society have emanated many public characters eminent for their scientific attainments.

" The meetings of this society will in future be held on Wednesday evenings, at eight o'clock, at their spacious Lecture Room, No. 148, Holborn Bars, near Gray's Inn

Lane, where it is confidently hoped that the institution will continue to receive that liberal support which it has heretofore experienced."

Abstracted Report of the Select Committee of the House of Commons on Machinery and Artizans, &c.

(Continued from page 221.)

Mr ALEXANDER GALLOWAY further examined.

Machines that make screws are allowed to be exported, and it is possible with one of those machines to make a French ploughman, in a week, capable of producing any quantity of screws, though if an English workman were to make those screws they could not be exported. The Act seems ingeniously contrived to injure British workmen without rendering any service to the country.

Mr. G. was obliged to forego a considerable French order for hydro-mechanical presses, because it was argued they might be employed in the woollen cloth manufactory—as well might they have prohibited saws, hammers, or hatchets—he refused also an order of some magnitude for flatting mills. As orders of this kind are to be delivered on ship board, they are not worth the attention of engineers, who would run the risk of having the goods left upon their hands. In some instances machines have been exported from a distant part of the kingdom, where their object was unknown to the officers.

By these prohibitory laws the French have been compelled to make such things as would have been made by English workmen. Mr. G. when visiting France in 1818, saw the very articles made there which he had been obliged to decline; they were rough in workmanship, but having made several, the improvement seemed progressive. If our prohibition laws had not existed, such factories would not have been established in France because the work produced is inferior to ours, and is more expensive in making than in England.

In October last, Mr. G. again visited France, and was very much struck with the public exposition of art in the Louvre, which he considers to be calculated, in a great degree, to improve mechanical knowledge and industry. In this exhibition, to those articles of the greatest merit, premiums were adjudged, and Mr. G. was astonished at the great progress France had made in all the various metallic works, since he last visited that country: there were specimens not to be surpassed in England. He particularly noticed the bottom of an extensive wrought iron circular boiler, formed of one piece of metal; he was not aware that several of those premiums were awarded to Englishmen.

Mr. G. is perfectly acquainted with every branch of the manufacture of iron and machinery, has recently put up an iron mill, therefore knows the making of iron, from its commencement, to the working of it in every shape; he is also well acquainted with the manufacture of copper, brass, lead, and steel, and knows all the facilities which we possess in comparison with France. He thinks that our laws have made France a rival to us in mechanics.

On being asked if the exportation of our best cotton machinery had been permitted, whether France would not have possessed an advantage over us in that branch of manufacture? Mr. G. replied that he had seen very excellent cotton machinery in France, made by E. Callas, a very able engineer, and has also seen English cotton machinery there at work, and considers that if our machinery had been exported, they would probably have been able to spin more cotton than they are at this moment in a condition to do, but then they would not have been able to make the machines which they now are: that nothing we can now do, will prevent France from being a successful rival to us in the mechanical arts, if she only continues improving as she has done in the last five years. If he were a German, or an American, and wanted a cotton machine, it would be a matter of indifference to him, whether he bought a machine at Paris or at Manchester, except as to the price.

In the first instance, in establishing such machinery, they must have experienced considerable difficulty, but now that is overcome. In France, at this time, they have at least about one-twentieth part of the quantity of cotton machines that we have, and that they are rapidly increasing that number.

Mr. G. knows that there are manufactories of considerable extent in many parts of Germany and Russia. He has supplied a considerable quantity of permitted machinery to Russia, and the prohibited parts they have since made for themselves.

It appears to be particularly necessary, not that the manufacture of France have so much improved, as to be enabled to serve foreign markets, that our laws should be amended, so as to permit us to export, as, from a combination of circumstances, we are enabled to underwork them, and execute with much greater dispatch; and there would be a great advantage in getting our machinery first introduced in other countries, which afterwards could not be readily displaced by our rival.

In the prices of cotton machinery in France and England, there is a difference of 30 per cent. in our favour, the machines can be made here so much cheaper than in that country, and the expence of freight would be trifling—15 or 20s. per ton; and of such machinery, a ton costs a very considerable sum; so that we could even supply the distant parts of France cheaper than they could be furnished from Paris,—that is, excepting import duties.

The demand for cotton machinery in France, very much exceeds their capability of furnishing it. This moment, English machinery would be paid for there, ten or twenty per cent. more than the French price,—not because it is superior, but because they cannot supply it in time. Two considerable manufactories known to Mr. G. have as many orders as they will be able to execute in six years. The most respectable manufactories in the neighbourhood of Paris are conducted by Englishmen; there are in Paris alone, between three and four thousand working engineers, and these manufactories have been established principally, if not entirely, in consequence of the English prohibition laws.

Mr. G. on being asked what was his opinion as to the capability of France being able to supply South America and that part of the world with machinery, stated that he considered France was not in a condition at present to supply any foreign market, nor would be for five or six years; but after that period, he thought she would be quite adequate to execute foreign orders. All the machinery now making in France, embrace the most recent English improvements: they are beginning to adopt iron for wood in the forming of their machines, which will give a durability and accuracy to them that wood cannot afford, and which is not embraced by some of our own manufacturers. Mr. G. is persuaded, that if the laws were rescinded, orders would be sent to England for machinery, equal to all that they are making at this time; in fact, an order has been offered to him to the amount of £30,000, but refused.

The articles alluded to were power-looms, cotton-machinery, mill-work, and steam-engines for the putting these machines in operation.

New Patents Sealed, 1824.

Francis Henry William Needham, of David-street, in the county of Middlesex, Esq. for his invention of an improved method of casting steel. — 1st October. — 6 months for inrollment.

To Walter Foreman, Esq. of Bath, in the county of Somerset, Commander in our Royal Navy, for his invention of certain improvements in the construction of Steam-Engines. 1st October. 6 months.

Frederick Benecke, of Deptford, in the county of Kent, verdigris manufacturer, and Daniel Towers Shears, and James Henry Shears, of Fleet-market, in the city of London, coppersmiths, in consequence of a communication from a certain foreigner, for certain improvements in the making, preparing, or producing of spelter, or zinc. 7th October. 6 months.

To Pierre Alegre, of Kerez de la Frontera, in the kingdom of Spain, engineer, now residing at Colet-place, Commercial-road, in the county of Middlesex, for his invention of an improved and more economical method of generating steam applicable to steam-engines and other useful purposes.—7th October, 1824.—2 months.

To Humphry Jeffreys, of Park-street, in the city of Bristol, merchant, for his new-invented improved flue, or chimney for furnaces and other purposes.—7th October, 1824.—2 months.

To Robert Dickinson, of Park-street, Southwark, in the county of Surry, Esq. for his new-invented improvement or improvements in the manufacture and construction of metal casks or barrels for the conveyance of goods and products by sea or otherwise.—7th October, 1824.—6 months.

To Francis Richman, of Great Pulteney-street, Golden-square, in the county of Middlesex, carpenter, for his invention of certain improvements in the construction of fire-escapes, parts of which said improvements are likewise applicable to other purposes.—7th October, 1824. 6 months.

To Stephen Wilson, of Streatham, in the county of Surry, Esq. in consequence of communications made to him by foreigners residing abroad, for certain improvements in machinery for making velvet and other cut works.—7th October, 1824.—4 months.

To John Ham, of West Coke, in the county of Somerset, vinegar maker, for his new-invented improved process for manufacturing vinegar.—7th October, 1824 — 4 months.

To Matthew Bush, of West Ham, in the county of Essex, calico-printer, for his invention of certain improvements in machinery, or apparatus for printing calicoes and other fabrics.—7th October, 1824.—6 months.

To John Shaw, of Milltown, in the parish of Glossop, in the county of Derby, farmer, for his invention of transverse spring slides for trumpets, trombones, French horns, bugles, and every other musical instrument of the like nature.—7th October, 1824.—2 months.

To John Thomas Hodgson, of William-street, in the parish of Lambeth, in the county of Surry, veterinarian, for his invention of certain improvements in the construction and manufacture of shoes, or substitutes for shoes for horses and other cattle, and method of applying the same to the feet.—7th October, 1824.—6 months.

To Philip Chell, of Earl's-court, Kensington, in the county of Middlesex, Esq. for his invented improvements on machinery for drawing, roving, and spinning flax, wool, waste silk, or other fibrous substances.—14th October, 1824 —6 months

To John George Bodmer, of No. 50, Oxford-street, in Charlton-row, in the parish of Manchester, in the county of Lancaster, civil engineer, for his invention and perfection of certain improvements in the machinery for cleaning, carding, drawing, roving, and spinning of cotton and wool.—14th October, 1824.—6 months.

To James Gunn, of Hart-street, Grosvenor-square, in the county of Middlesex, coach-maker, for his invention of certain improvements on wheeled carriages.—14th October, 1824.—6 months.

To William Philip Weise, of Tooley-street, Southwark, in the county of Surry, manufacturer, for his invention of certain improvements in the preparing and making waterproof cloth, and other materials for the manufacturing hats, bonnets, and caps, and wearing apparel, and in manufacturing the same therefrom.—14th October, 1824. 6 months.

To Henry Marriott, of Fleet-street, in the city of London, ironmonger, for his invention of an improvement on water-closets.—14th October, 1824.—2 months.

To James Tetlow, of Manchester, in the county palatine of Lancaster, weaver, for his invention of certain improvements in power-looms, for weaving various articles.—14th October, 1824.—6 months.

To Henry Maudslay and Joshua Field, both of Lambeth, in the county of Surry, engineers, for their invention of a method and apparatus for continually changing the water used in boilers for generating steam, particularly applicable to the boilers of steam-vessels making long voyages, by preventing the deposition of salt or other substances contained in the water, at the same time retaining the heat, saving fuel, and rendering the boilers more lasting.—14th October, 1824.—6 months.

The Comet has since our last communication, entered the constellation Draco, and may be found by drawing a line from θ through ι in the tail of that constellation. The telescope must be directed about the same distance from ι as the stars are asunder.

CELESTIAL PHENOMENA, NOVEMBER, 1824.

D.	H.	M.	S.	
1	0	0	0	⊙ dec. 14° 31′ 21″ S.
1	8	22	0	☽ passes the meridian.
2	16	0	0	♄ in conj. with ε in Taurus
3	13	27	2	♃'s 2nd. Sat. will immerge.
4	17	0	0	☽ in conj. with η in Pisces
5	11	0	0	☿ in conj. with λ in Virgo.
5	17	10	33	♃'s 1st Sat. will immerge.
6	0	0	0	⊙ dec. 16° 4′ 18″ S.
6	7	42	0	Ecliptic opposition ○ full moon.
6	12	5	0	☾ Passes the meridian.
7	8	0	0	☾ in conj. with η in Taurus.
7	11	38	51	♃'s 1st. Sat. will immerge.
9	20	0	0	☾ in conj. with η in Gemini.
10	0	0	0	☾ in conj. with μ in Gemini.
10	13	0	0	☿ in conj. with 2 α in Libra.
10	16	1	57	♃'s 2nd Sat. will immerge.
10	17	0	0	☾ in conj. with ζ in Gemini.
10	23	0	0	☾ in conj. with δ in Gemini.
11	0	0	0	⊙ dec. 17° 30′ 32″ S.
11	16	42	0	☾ passes the meridian.
13	9	0	0	☾ in conj. with ξ in Leo.
13	12	18	0	☾ in □ last quarter.
13	13	0	0	☾ in conj. with ο in Leo.
13	21	0	0	☾ in conj. with π in Leo.
14	1	0	0	♀ in conj. with β in Oph.
14	13	32	6	♃'s 1st Sat. will immerge.
15	12	20	25	♃'s 3d Sat. will immerge.
16	0	0	0	⊙ dec. 18° 49′ 15″ S.
16	20	57	0	☾ passes the meridian.
17	18	36	59	♃'s 2d Sat. will immerge.
20	8	1	0	Ecliptic Conjunction ● New Moon.
20	11	0	0	♂ in conj. with ♅ long 13° in Cap. ♂ lat. 1° 21′ S. ♅ lat. 24 S. diff. lat. 57′.
21	0	0	0	⊙ dec. 19° 59′ 36″ S.
21	0	35	0	☽ passes the meridian.
21	15	25	21	♃'s 1st Sat. will immerge.
21	19	34	0	⊙ enters Sagittarus.
21	20	0	0	☽ in conj. with ϑ in Oph.
21	22	0	0	☽ in conj. with B in Oph.
22	4	0	0	☿ in conj. with 1 β in Scorpio.
22	12	48	6	♃'s 3d Sat. will immerge.
22	16	18	57	♃'s 3d Sat. will immerge.
22	18	0	0	☽ in conj. with ♀ long. 0° in Cap. ☽ lat. 0° ♀ lat. 1° 28′ S. diff. lat. 1° 28′
23	12	0	0	☽ in conj. with 1 ν in Sag.
23	16	0	0	☽ in conj. with ο in Sag.
23	18	0	0	☽ in conj. with ♅ long. 13° in Caprioornus. ☽ lat. 1° 0′ N. lat. 24′ S. diff. lat. 1° 24′
23	19	0	0	☽ in conj. with π in Sag.
25	5	0	0	♀ in conj. with λ in Sag.
26	0	0	0	⊙ declination 21° 0′ 48″ S.
26	4	50	0	☽ passes the meridian.
28	2	55	0	☽ □ first quarter.
28	10	30	17	♃'st 2d Sat. will immerge.
28	17	18	35	♃'s 1st Sat. will immerge.
29	0	0	0	Stationary.
29	16	45	46	♃'s 3d Sat. will emerge.
30	2	0	0	☽ in conj. with ω in Pisces.
30	11	46	55	♃'s 1st Sat. will immerge.

Rotherhithe. J. LEWTHWAITE.

The waxing moon ☽ the waning moon ☾.

ERRATA FOR OCTOBER.

	D.	H.	M.	S.	
For	13	19	34	0	read 13 19 34 0
	19	4	0	0	♀ in conj. &c. read ☿ in conj. &c.
	25	20	0	0	☽ in conj. with ☿ read ☽ in conj. with ♂
	29	15	17	15	♃'st read ♃'s 1st

METEOROLOGICAL JOURNAL, SEPT. AND OCT. 1824.

1824.	Thermo.		Barometer.		Rain in inches.	1824.	Thermo.		Barometer.		Rain in inches.
	Higt.	Low.	+	—			Higt.	Low.	+	—	
SEPT.						OCT.					
24	67	51	29,96	29,27	,05	10	54	45	29,50	29,10	,05
25	63	51	—,96	—,86	,075	11	56	46	28,94	28,89	1,05
26	50	37	—,94	—,86	,025	12	53	40	29,04	—,88	,125
27	54	35	—,57	—,48	. .	13	48	33	—,44	29,27	. .
28	51	31	—,70	—,87	. .	14	52	28	—,56	—,48	,025
29	58	28	—,85	—,78	. .	15	48	29	—,65	—,56	,15
30	69	40	—,59	—,40	. .	16	45	28	—,89	—,76	. .
OCT.						17	49	27	30,00	—,90	. .
1	61	40	—,26	—,08	,425	18	51	25	—,05	30,04	,025
2	62	45	—,46	—,30	.125	19	58	31	—,03	29,98	. .
3	65	44	—,79	—,69	,325	20	59	49	—,00	—,94	. .
4	66	42	—,79	—,69	,025	21	60	35	29,95	—,93	. .
5	64	50	—,60	—,54	,05	22	59	35	—,88	—,83	. .
6	65	54	—,47	—,30	,125	23	63	49	—,92	—,83	,025
7	64	55	—,27	—,23	,25	24	64	42	—,80	—,66	. .
8	66	53	—,38	—,28	,125	25	63	51	—,54	—,50	0125
9	65	48	—,54	—,46	. .						

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

Captain Cochrane, the pedestrian traveller, who we are much indebted to for the account of Siberia, &c. in his late published peregrinations, was at Barbadoes early in August, on his way to perform a pedestrian tour in South America.

The Gaelic Dictionary, by Mr. Armstrong, is again proceeding, as the publisher has made arrangements for reprinting the sheets, lost at the late fire at Mr. Moyes's.

The Monumenta Authentica Angliæ, Scotiæ, et Hiberniæ, in eight folio volumes, compiled from the Vatican Library by M. Morine, has been completed. It is said to contain nearly ten thousand Letters, &c. of Pope's, from the time of Honorius III. (A. D. 1216) to a late period, and of the autographs of British Kings and Queens, during the same extended epoch.

In the Kelso Mail newspaper is mentioned the discovery of an island in the South Pacific Ocean, by Captain B. Wight, of the Medway, merchant vessel. It lies in latitude 21 deg. 36 min. long. 159 deg. 40 W. of Greenwich. Its length from east to west is about 20 miles; the land being very high, Capt. W. named it Roxburgh Island, after his native country.

NORTHERN EXPEDITIONS.——The Newfoundland papers of the 24th August state that the Snap surveying vessel had left the Griper off Cape Sedley with the Arctic Land Expedition, which was prevented by the ice from prosecuting its course farther. Dispatches received at the Admiralty are said to have announced that the Griper was at the entrance of Hudson's Straits on the 4th of August, and proceeding on its voyage, with the expectation of reaching Repulse Bay in September. Captain Frankling is still in England, and does not leave until after Christmas.

In a short time will appear, in 4 vols. 8vo. the Historical Works of Sir James Balfour Lord Lyon, King at Arms to Charles I. and II.

Sir Thomas Brisbane has made some important discoveries in the interior of New Holland. A very large river, navigable for ships of great burden, has been discovered, and he has himself proceeded to the interior to make such observations and surveys as may render the discovery available to commerce.

An immense raft of American timber has just arrived in the River Thames' having been floated from Canada across the Atlantic Ocean by a novel kind of navigation. It is considered to have been an effort of great enterprize, and is attracting many to Blackwall, the spot where it is at present stationed.

A new work on Algebra has just appeared, from the joint exertions of Mr. Peter Nicholson and Mr. Rowbotham. Our limits prevent us from expatiating upon its merits at any great length. We can, however, most decidedly recommend it as possessing facilities for the attainment of that branch of science which we do not discover in any other work of the kind. The method of treating arithmetical progression, in particular, deserves attention, for the examples not only furnish questions in simple equations when there are one or two unknown quantities, but also in adjected quadratics. The same remark will apply to the mode which the authors have adopted, of extracting the roots of equations, which appears more clear and comprehensive than any method before adopted. The summation of sines is treated in such a manner, as not only to store the mind of the student with much additional information, but also to show its application to subjects hitherto considered extraneous. The binomial theorem, as regards its application to the expansion of the surd, under the radical sign, into a series, is much less laborious than any previous method, and so evident, as to be at a single glance discernible. Upon the whole, though the authors have had an eye to the practical, they have not neglected the theoretical part of their algebra. The demonstration of every rule that in the slightest degree required it, proves the truth of our observation, so that the work may be considered as one of the most practical and scientific of the day.

Mr. Burridge, who has lately written on Naval Dry Rot, &c. is now publishing a new process for tanning leather, in one quarter of the usual time, with or without oak bark, whereby naval oaks may be saved from destruction by being always hewn in summer, instead of winter. This gentleman intends to publish a Short Essay on Civil Architecture, containing new methods of preventing Dry Rot on Terra Firma, after he has completed a patent which he has in progress on that subject.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

THE

London

JOURNAL OF ARTS AND SCIENCES.

No. XLVIII.

To William Warcup, *of Dartford, in the County of Kent, Engineer, for an Improvement or Improvements in the Construction of a Machine called a Mangle.*

[Sealed 3d April, 1823.]

In this improved Mangle for smoothing of linen cloth and other articles of wearing apparel and domestic use, the cylinder upon which the goods are rolled revolves in stationary bearings, while the curved bed or surface against which it presses, slides to and fro under the cylinder.

Plate XII. Fig. 1, is a section of the improved mangle, in which all the essential parts of the machine are seen; *a* is the cylinder made of hard wood, upon which the linen cloth, or other articles intended to be mangled, are rolled; *b b* is the bed of the mangle, made also of hard wood, and formed in the segment of a circle, which bed is affixed to the arms *c c* at the ends of the machine. The curved double rack *d d* is also attached to the bed and

to the arms, and the whole swings with an alternating pendulous motion upon pivots, which are supported in the end standards, or iron framing; *e* is a pinion at the extremity of a rotatory shaft, which is turned by gear from the axle of a fly-wheel. When this shaft *e* revolves, the teeth of the pinion taking into the curved rack *d*, drives the rack, and also the bed *b*, to one side of the machine, as shewn by dots, and then the pinion turning at the extremity of the curve, falls into the lower rack, and drives the bed and rack back again in the opposite direction. Thus the bed is made to pass to and fro under the cloth cylinder, and thereby produce the smoothing of the goods.

Very considerable pressure, however, is necessary to perform the operation of mangling with effect, and this is obtained by a great weight acting upon the cylinder *a*. Two levers *f f* are made to press upon the pivots of the cylinder *a* at each end, and these levers are drawn down by chains *g g* attached to their extremities, from which chains a box *h*, to be loaded with stones or other weights, is suspended; thus the entire weight of the loaded box exerts itself upon the mangling cylinder, and as the bed passes to and fro by the means before described, gives that pressure to the linen or other articles under operation which is required.

When the smoothing of the articles is considered to have been sufficiently effected, they are to be withdrawn from the machine by the following contrivance:—The lever *i* attached to the shaft *k*, is to be brought down from the perpendicular to a horizontal position, by which means the shaft will be turned one quarter round; upon the shaft are fixed two cylindrical blocks *l l*, round which chains *m m* pass, that suspend the weighted box, by a bar crossing its centre, and thus by the descent of the lever *i*, the chains *m* and the box *h* will be drawn up, and the weight or pressure taken off the pivots of the mangling cylinder. The cylinder may now be raised from the bed by pressing upon the lever *n* with the foot, which will force up the rod *o*, and thereby raise the cylinder so as to remove it from the bed; *p* is a flap or table on the side of the mangle, upon which the linen or other articles may be spread out upon the wrapper, and rolled upon the cylinder, previous to being introduced into the mangle.

[*Inrolled June*, 1823.]

To JOHN GREEN, *of Mansfield, in the County of Nottingham, Whitesmith, for an Improvement in the Machines used for Roving, Spinning, and Twisting Cotton, Flax, Silk, Wool, or other Fibrous Substances.*

[Sealed 26th June, 1823.]

THIS improvement in Roving and Spinning Machinery, applies to those parts of the machine that effect the taking up or winding of the thread upon the bobbin, which is produced by a movement independent of the ordinary revolution of the bobbin and flyer. In order to render this invention evident, a representation of the spindle, flyer, and bobbin, with the improved appendages is given partly in section in Plate XII. Fig. 2.

In this figure *a*, is a single spindle, being one of a series to be actuated by a cord leading from a drum, and passing round the pulley *b*, or in any other usual way, by which the spindles are made to revolve; *c* is the flyer affixed to the top of the spindle, through which the filament of thread passes from the drawing rollers as usual, and by its arm the thread is guided on to the periphery of the bobbin *d*. The bobbin is supported and carried round by a small circular plate *e*, fixed on to the top of a tube *f f*, which slides upon the spindle. Within this is another tube *g*, moving with the tube *f*, and having a groove in the internal part, in which a small stud *h*, extending from the spindle, acts. This groove is formed by cutting a piece of tube into two parts, in a curved direction, as shewn by the detached portion of tube fig. 3, and then fastening these pieces, by rivets or otherwise, within the tube *g* as shewn at *i i*, fig. 2, leaving the curved groove in which the pin or stud *h* is made to rise and fall, as it carries the tubes *g* and *f* and the bobbin round with the spindle.

If the bobbin revolved with the same speed as the spindle and flyer, the thread spun would not be laid (that is wound) upon the bobbin, but if the revolution of the bobbin be retarded, the thread will be laid accordingly. The object then of this contrivance, is to retard in a small degree the revolution of the bobbin, by which it shall revolve in the proportion of about nine times to ten of the spindle, and hence in every ten revolutions of the spindle, the thread will be laid once round the bobbin.

The variation of speed between the bobbin and the spindle and flyer, is produced by causing the pin or stud *h* to rise and fall in the groove of the tube *i* as the spindle is going on; and this is done by raising and depressing the taking-up rail or bar *k*, which, by the boss *l* setting into a recess in the rail, supports the tubes *g* and *i*; hence the depression of this rail carries the stud *h* up the curved groove on one side, and the rising of the rail causes it to come down on the other side of the groove, and thus slowly, but progressively retard the revolution of the tubes *i*, *g*, and *f*, and of the bobbin attached thereto, as before said.

The manner in which this taking-up rail *k* is moved, will be understood by reference to the end view, (seen partly in section) of a complete machine, shewn at fig. 4.—In this figure *a* is the main shaft, having a rigger upon its end, which is actuated by a band leading from a steam-engine, on any other first mover; upon this shaft is a drum *b*, from whence a band extends downwards to a cone *c*, and the revolution of the axle of this cone gives motion to the other parts of the machinery. At the end of the axles of the cone *c* there is a pinion, which takes into a toothed-wheel upon the shaft of a heart-wheel *d*, and this heart-wheel acting between two studs in the rack *e*, causes that rack to slide to and fro as the heart wheel goes round. By the sliding of this rack the pinion *f* is turned a portion of a revolution backward and forward, and by that means the rack *g*, which supports the taking-up rail *k*, (above mentioned in fig. 2.) is raised and depressed.

This taking-up rail, which raises and depresses the tubes as explained above, is by the last described arrangement of machinery made to ascend and descend once during ten revolutions of the spindle, and thereby the taking up or laying of the thread upon the bobbin is effected in the proportion and manner first described.

These are the features of novelty claimed by the patentee as adapted to a roving and spinning machine, but to render the operation of roving and spinning evident, a general description of the several parts and movements of the machine may be desirable, and this will be understood by reference to fig. 4.

The copts of cotton or other materials are placed in the back part of the machine upon loose spindles as at *m m*, from whence the filaments are drawn and stretched by the several pairs of drawing rollers as at *n*. From the front pair of rollers, the filaments are conducted through the eyes of the flyer, and are spun into a thread by the rapid revolution of the spindle, actuated by a cord passing from the drum *o*, which is put in motion by a band leading from the rigger on the main shaft *a*. From a drum *b* on this main shaft, a band extends to the cone *c*, and gives that rotatory motion to the axle of the cone, which by means of gear moves the other parts of the machine.

Upon the end of the axle of the cone a pinion is fixed, which as it revolves turns the toothed-wheel that actuates the heart-wheel *d*, and by the excentricity of this heart-wheel the rack *e* is moved, which raises and depresses the taking-up rail in the manner already described. At the end of the axle of the heart-wheel a pinion is fixed, which takes into another toothed-wheel *p*, and at the reverse end of the shaft of *p* there is a pinion, that takes into the teeth of what is called a mangle-wheel, that is a wheel with a circle of rails, which is so constructed that the pinion may gear into its rails as teeth, alternately either on the outside or inside of its periphery; by which means the last mentioned pinion as it continues revolving in one direction, gives a reciprooating revolution to the mangle wheel.

Attached to the shaft of this mangle-wheel at the reverse end is the pinion *j*, taking into a rack *r*, that supports the copping rail *s*, and as the revolution of this pinion reciprocates, an ascending and descending movement is given to the rack and to the copping rail, which carries the bobbin up and down upon the spindle, for the purpose of enabling the thread to wind in coils one beside the other over the whole surface of the bobbin.

The bobbins progressively increasing in diameter as the threads wind upon them, renders it necessary to regulate the speed of the taking up, and of the copping, in order that the tension of the thread may be uniform. This is done by sliding the band from the smaller to the larger part of the cone *c*, by which means the velocity of the cone, and of the wheels connected to it, will gradually diminish and cause the operations of taking up and copping to be performed with a speed always commensurate to the circumference of the thread wound upon the bobbin. The manner in which this shifting of the band is effected, varies but slightly from the ordinary mode of accomplishing that object.

The axle of the cone hangs in levers or arms that are capable of rising and falling, so as to accommodate themselves to the length of the band. A guide *t* embraces the band, and this guide is attached to a nut or screw-box that moves upon a long horizontal shaft, with a worm or thread cut in it. A cord is coiled round a pulley at the end of this shaft, with a weight suspended, by which the shaft is to be drawn round, but is held by a pall or detant, taking into a ratchet wheel fixed to the end of the shaft.

This pall or detant is occasionally raised so as to allow one tooth of the ratchet to escape, and thus the shaft is turned by a succession of starts, and the screw-box which carries the guide is progressively advanced, pushing the band from the lesser to the larger diameter of the cone, and thereby diminishing the speed of the wheels connected to the taking up and copping contrivances.

[*Inrolled, December*, 1823.]

To JOSEPH TAYLOR, *of Manchester, in the County Palatine of Lancaster, Machine Maker, for certain improved Machinery or Apparatus to facilitate or improve the Operation of Spinning, Doubling, and Throwing Silk, Cotton, Wool, or Flax, or Mixtures of the said Substances.*

[Sealed 29th April, 1823.]

THE patentee states, that the modes of conducting the filaments or thread of the material intended to be spun or doubled, have hitherto been found to be very imperfect, that different threads dissimilar in substance, in passing through the conducting rollers, have been delivered to the flyer of the spindle with different degrees of tension, and hence the spinning or doubling of the filaments or threads under such circumstances have produced a knotty or uneven cord. Various have been the contrivances resorted to for the purpose of remedying this evil: and the subject of the present patent is one by which the desired object is considered to be more effectually accomplished than by any other mode previously adopted. The invention, however, is to be employed in conjunction with the ordinary construction of spinning machinery, and consists simply in the peculiar mode of conducting the filaments or thread through and over the guide-rollers.

Plate XII. Fig. 5, shews a section of the side of a spinning machine, with the improvement added thereto; *a a* are the copts from which the threads are drawn, these are placed loosely upon axles in a horizontal position. The threads proceeding from the copts are conducted through the eyes of bent wires *b* to the upper part of the crook *c*, where they unite and pass over the

upper guide-roller *d*, then between that and the lower guide-roller *e*, to the lower turn of the crook *c*, from whence the threads again pass over the upper guide roller *d*, and down over the guide roller *f*, to the flyer and spindle where the bobbin takes up the thread that has now become doubled as in the ordinary manner.

The particular construction of the upper and lower guide-rollers, *d* and *e*, form a part of the patentee's claim, instead of making those rollers of a straight cylindrical shape it is proposed to reduce the central diameter of each roller, so that their surfaces may only touch near the edges, leaving a space round the central part of the periphery for the threads to pass between without being pressed upon. Rotatory motion is to be given to the lower roller *e*, by the ordinary means, and the friction of the upper roller *d*, which presses upon it, causes that roller to revolve, and to conduct the threads in the manner above described.

[*Inrolled, October*, 1823.]

To EDWARD COWPER *of Kennington, in the County of Surry, Machinist, for certain Improvements in Machines and Apparatus for Printing Calico, Linen, Silk, Woollen, Paper, or other Substances capable of receiving Printed Impressions.*

[Sealed 10th June, 1823.]

THESE improvements are intended to be employed either as auxiliaries to the ordinary calico printing apparatus, or as the essential parts of a printing apparatus of a novel construction. In the first instance, the improved parts are adapted to the old, for the purpose of effecting a double or treble impression; that is, to print two or more colours, or give the impression from two or more blocks or plates at one time; by which means a whole subject, that is, the several parts and colours of the pattern, may be printed without removing the calico or other material from the press.

Plate XIII. fig. 1, exhibits the side view of a printing machine, constructed with these improvements:—*a*, is a cylinder or drum, over the periphery of which the calico, linen, silk, woollen, or other materials is distended, its tension being kept by any of the ordinary modes; *b*, is a spur-wheel actuated by a winch, which spur-wheel by gearing into the teeth of the wheels *c* and *d*, gives motion both to the old and the new parts of the apparatus; *e*, is a toothed-wheel upon the axle of the roller, that supports the bed *f*, upon this bed the printing plate or block *g*, is fixed. The rotation of the wheel *d*, turns the wheel *e*, and that carries the bed *f*, with the plate *g*, along under the cylinder *a*, and thereby gives the first impression to the calico or other material distended round the drum. When this plate has effected its object, the flated part of the roller comes against the under side of the bed, and relieves the plate, allowing the bed to run back again; which contrivance, and the mode of inking or giving colour to this plate or block is not claimed in this patent.

The new parts are intended to give a second impression or another colour to that portion of the calico or other material, which has been already printed in one colour by the plate *g*. For this purpose the wheel *c*, which moves loosely upon its axle, independently of the drum, and is actuated by the spur-wheel *b*, takes into and turns the toothed-rim *h*. This toothed-rim *h*, is fixed to the axle of what is called the a D roller, which with its operative parts are best seen by the detached figure 2, where the toothed-rim is removed.

On the flat side of the D roller, the plate or printing block *j*, is fixed, which is inked or coloured by the rollers *l*. In the ink or colour trough *m*, there is a roller that supplies the upper roller or ductor *n*, with colour, and from thence the colour is conveyed by the elastic roller *o*, to the periphery of the D roller, where it is distributed. As the D roller revolves, the cam or excentric-wheel *p*, upon its axle occasionally presses back the carriage of the elastic roller *o*, and causes a supply of the ink to be taken from the ductor *n*; and when the cam retires the elastic roller comes again in contact with the periphery of the D roller, and spreads the ink upon its surface, which being taken up by the inking-rollers *l*, is by them communicated to the plate or block *j*, when the rotation of the D roller brings the plate under the inking-rollers.

The manner in which the rotation of the D roller is produced, and the pressure given that effects the printing of the calico will be understood by again referring to fig. 1.

The axle of the D roller, and of its toothed-rim is mounted on a sliding carriage, by which the teeth of the rim are enabled to keep in gear with the wheel *c*, as that wheel revolves. Attached to the side of the toothed-rim *h*, is a cam of a heart-shape *i*, the point of which cam acts against a friction-roller *k*, and hence when the point of the cam comes round to the friction roller as in the figure, the flatted part of the toothed-rim is forced up into gear with the wheel *c*, and the plate or block is at the same time brought in contact with the calico or other material on the surface of the drum, when by the resistance of the friction roller pressing up the cam, and with it the D roller, the impression is given to the calico.

It is to be observed that the dimensions and disposition of the two printing plates or blocks, *g* and *j*, must be so proportioned to each other, that the figure partly printed upon the calico by *g*, shall, as the drum turns round, be accurately taken up by *j*, and perfected; that is, the plates shall be of equal sizes, and the patterns thereon cut be adjusted to perfect register. In the same manner two D rollers may be adapted, and consequently a third colour may be printed upon the material without removing it.

A further improvement is proposed in the adaptation of a number of blocks or plates, capable of printing several colours in immediate succession, without shifting the calico or other material from its bed. This is done by an apparatus shewn at fig. 3; *a a a a*, are four plates or blocks affixed to a revolving prism; to the axle of this prism is attached the crank rods or arms *b*, the posterior extremities of which arms are attached by a joint to the side of a toothed-wheel *c*, near its periphery, and this wheel is turned by the revolving of the larger toothed-wheel *d*, which is four times the diameter of the lesser wheel, and therefore drives it round in the exact proportion of four to one. The calico, linen, silk, woollen, paper, or other material, *e e*, as aforesaid, about to be printed, is conducted into the apparatus between the three rollers, *n*, *o*, *p*, and laid against the face of a perpendicular bed, *f*, which, being padded as usual, is to receive the pressure of the blocks or plates, *a a a a*, in succession, and thereby permit a perfecting of the pattern in its several colours, without removing the portion of calico or other material from the bed; and the ink or colours, suppose them to be black, red, blue, and yellow, are to be laid on the blocks *a a a a*, as they come up in succession to the top, by an elastic hand roller.

The impression is given by the eccentricity of the joint or crank, at the end of the arm *b*, which, as the small wheel *c* is driven round by the larger wheel *d*, causes the frame *h*, that carries the prism, to slide to and fro, either pressing up the printing block *a* against the bed *f*, or carrying it back, as seen in the figure. The prism is made to turn over one quarter of a revolution, after every impression has been given, by means of a pall on the side of the toothed-wheel *i*. This wheel *i*, which is loose upon its axle, is shewn with a portion of the rack *k*, and a ratchet-wheel *l*, affixed to the axle of the prism, in the detached fig. 4. As the arm *b*, goes back, after an impression has been given, the rack *k* causes the wheel *i* to turn, and that carrying round the pall, drives the ratchet, and with it the prism, one quarter of a revolution, by which means another of the plates, or blocks *a*, is brought to act against the calico at the next advance of the prism. The wheel *i* retrogrades upon its axle, as the prism advances, carrying back the pall with it ready to take another tooth of the ratchet, and turn it over the next time that the prism recedes.

It will hence be perceived, that one revolution of the larger wheel *a*, (actuated by hand or other power) will cause the lesser wheel *c* to turn four times, and consequently by the arrangement described, to effect four advances of the prism, by which means the four several plates, or block *a a a a*, with their respective parts of the pattern or design to be printed in the four several colours, so as to produce one whole design, will be successively brought against the bed *f*, and the pattern or design thereby perfected.

The completion of the whole pattern being effected upon a certain portion of the calico or other material, that portion is now to be withdrawn from the bed, and another portion brought into the same place, to be printed in like manner. This is done by means of a wiper *l*, on the large wheel *d*, which, at every revolution, strikes against one of the arms, *m m m*, of the toothed-wheel *n*, and drives it round one-third of a revolution. This wheel takes into another wheel *o*, and that into a third *p*, so that they move simultaneously, and the calico or other material passing over drums upon the axles of these wheels, is hence, by the turning of the wheel in the manner shewn, carried forward, after every four impressions of the printing plates or blocks.

[*Inrolled December*, 1823.]

To JOHN FISHER, *of Greet Bridge, in the Parish of West Bromwich, in the County of Stafford, Iron Founder, and* JOHN HORTON *the Younger, of the same Place, Manufacturer of Steam Boilers, for their Invention of an Improvement in the Construction of Boilers for Steam-Engines, and other Purposes where Steam is required.*

[Sealed 8th July, 1823.]

THE object of this improvement is to collect steam in a reservoir, and carry it from that reservoir to the engine, instead of allowing the steam to pass immediately from the boiler to the engine, as in the ordinary way. The mode of effecting this is by constructing the reservoir within the boiler, and passing the steam from the upper part of the boiler, through a tube, down into the reservoir, where it loses none of its heat by radiation, being surrounded with boiling water.

The adaptation of this principle is capable of considerable variation, and the patentees have exhibited one mode of construction, as eligible for the purpose of obtaining the desired object. Plate XIV. fig. 1, is a section of the boiler and reservoir; those parts of the vessel that are occupied with water are marked *a*, which water is supplied from a reservoir above, through the pipe *b*. This vessel is to be surrounded by the furnace and flues, or nearly so, and by that means the water is made to boil, when the steam arising therefrom will collect in the upper part *c c* of the boiler, and pass through the bent tube *d d*, down into the reservoir *e e*. From the reservoir the steam will rise up the pipe *f*, and thence proceed to the engine.

There is a safety valve *g*, at the upper part of this last-mentioned pipe, to prevent accidents, in the event of the steam increasing in force beyond that pressure desired to be employed. There are cocks for drawing off the water when required, and also a cock for the purpose of discharging the condensed steam. Man holes are likewise to be formed in the vessel, for the purpose of gaining access to the interior, but these must be made perfectly secure, and luted to prevent the escape of steam.

A boiler of this construction, or upon a similar principle, may be employed to generate steam to work an engine, either at high or low pressure, and its form may be as shewn in the figure, or of any other that circumstances or convenience may dictate.

[*Inrolled, September*, 1823.]

To John Hall, *the Younger, of Dartford, in the County of Kent, Engineer, for an Improvement in the Machinery to be employed for effecting or producing the Pressure on Linseed, Rapeseed, or any other oleaginous Seed or Substances, from which Oil can be expressed, for the purpose of expressing Oil from the aforesaid Seed or Substances.*

[Sealed 23rd April, 1823.]

The ordinary mode of pressing seed for the purpose of extracting oil, is stated to be by enclosing the seed in hair bags, and introducing those bags into presses where a progressive force is exerted upon them by driving up wedges. The invention of the patentee, is the employment of cams or excentric rollers, which by the power of a steam-engine are turned round, so as to press laterally against sliding plates of iron, which form the sides of boxes, that contain the bags of seed to be operated upon.

Plate XIV. fig. 2, is a vertical section of an apparatus of this desc iption; *a a* are sides of an extremely strong iron box; and *b b b b* are plates between which the seeds are pressed on both sides of the apparatus. The seeds are put into the hair bags with leathern cases as usual, and these bags are then placed between the pressing plates as at *c c*. Upon the axles of two horizontal shafts, there are two eliptical cams *d d*, which when situate with their longest diameter in a horizontal direction, as shewn in the figure, press against the inner plates *b b*, and force the bags of seed *c c*, against the other plates next the sides of the box, by which means the oil becomes expressed from the seed, and is allowed to flow out through the apparatus in the bottom. When this pressure has been exerted for a sufficient length of time, the cams are turned round so that their longest diameter shall be in a vertical direction; the pressure is then taken off the bags of seed, and the plates *b b*, are drawn back by means of leather straps *e e*, which are attached to the plates, and pass over the cams; the longer diameter of the cams raising the straps, and thereby drawing the plates toward each other. The compressed bags are now removed from the press, and other bags with fresh seeds introduced, and operated upon in the same way.

It should be stated that the section of the press described, and referred to as above by the letters *a*, *b*, *c*, *d*, *e*, exhibits only one end of the apparatus: a similar press is also at the other end, and in the middle above the press is a steam-cylinder with a working piston, which is intended to move the cams at both ends.

The principal feature of this invention, consists in the employment of the eliptical cams as described for giving the pressure, but a mode of working these cams is also set forth in the specification, though not claimed as new.

Steam from a boiler being admitted into the cylinder *f f* in the usual way, either at the upper or lower end, the piston *g* (shewn by dots) will, by the elastic force of the steam, be raised or depressed; and in so moving, the cross arm *h* will carry up or down the rods *i i*, which lift or depress the levers *k k*, that are attached to the shafts of the cams. The cams at the reverse end of the shaft stand with their longest diameters at right angles to those shewn in the figure; consequently, when the pressure is exerted upon the seed-bags, in the box at one end of the apparatus, the bags at the other end are released, and may be removed. Other bags full of seed are now introduced as described, and the steam being admitted at the contrary end of the cylinder, the piston is forced back again, and thus the pressure is alternately exerted in one or the other box.

It is proposed, that the seeds shall be heated before being introduced into the press; and for this purpose vessels, surrounded by steam chambers, are to be placed near the press, capable of holding a quantity of the seeds, which are to be stirred constantly during the heating process, and then passed from those vessels through hoppers, into the bags in which they are to be pressed.

By this improved apparatus, and mode of pressing seeds, a greater quantity of oil may be extracted than by the ordinary mode, and the oil-cakes left in the bags after compression will be much lighter than those usually produced. The operation, that is, the alternating of the cams, which effect the pressing, may be carried on faster or slower, according to the will of the workmen, and which is regulated by the spaces of time betweeen the opening and closing of the induction and eduction passages of the steam cylinder.

[*Inrolled, June*, 1823.]

To WILLIAM SOUTHWORTH, *of Sharples, in the County of Lancaster, Bleacher, for certain Machinery or Apparatus, adapted to facilitate the Operation of Drying Calicoes, Muslins, Linens, and other similar Fabrics.*

[Sealed 19th April, 1823.]

THIS invention is a particular arrangement of machinery for the purpose of hanging up wet cloths in a drying house, which contrivance will be best understood by reference to Plate XIII. Fig. 5. is a section of the drying-house, where *a* is a furnace and boiler for the purpose of generating steam; it is furnished with a safety-valve in the tube *b*, at top, and from this tube the steam main *c*, passes down to the floor of the basement story. From this main a series of steam-pipes, as *d d*, extend over the surface of the floor, and from them heat is intended to radiate, for the purpose of warming the drying-house.

Along the middle of the building a strong beam of timber *e e*, extends, and is supported by cast-iron pillars; from this beam, to bearings on the side walls, a series of rails are carried in a cross direction, over which rails the wet cloth is to be hung in folds, and the steam or evaporation emitted in drying is allowed to escape through apertures or ventilators in the roof.

The mode by which the cloth is delivered on to the rails, on either side of the beam, will be best understood by reference to the delivering carriage, which is shewn with its rollers partly in section, and upon a larger scale, at fig. 6.

The wet cloth is first to be coiled upon a roller, and then placed in the carriage, as at *f*, with its pivots bearing upon inclined planes. The carriage is to be placed at the commencement of the rails, running upon the middle beam, and also upon side-bearings or rail-ways extending along the side walls of the building, parallel to and upon a level with the middle beam. The carriage is made to travel by means of an endless band passing over two riggers, *g* and *h* in fig. 5, and over pullies and a band-wheel attached to the carriage, as will be explained. The rigger *g*, that moves this endless band, is actuated by bevel gear, seen at *i*, fig. 5, which is put in motion by a pinion at the end of a revolving shaft leading from a steam-engine.

In fig. 6, *k k*, is the endless band passing over the pulley *l*, under the band-wheel *m*, and over the pulley *n*, by which it will be perceived that the traversing of the band, as described, would cause these pulleys and wheels to revolve. On the axle of the band-wheel *m*, there is a drum *o*, against which the roll of wet cloth *f* presses, and as this drum revolves, the roll of wet cloth is by its friction made to turn in a contrary direction, and to deliver off the cloth on to the periphery of the drum *o*, from whence it passes over the roller *p*, and descends to the rails. Upon the end of the axle of the band-wheel *m*, there is a pinion, which takes into the teeth of the large wheel *q*, and upon the axle of this large wheel there is a pinion that actuates the intermediate wheel *r*, which turns another toothed-wheel *s*. This last-mentioned toothed-wheel takes into cogs upon the side railway, and hence as the train of wheels move round, the carriage to which the wheels are attached is slowly impelled forward.

As soon as the wheels begin to move, and the carriage to advance, the wet cloth begins to uncoil, and to pass down over the roller *p*; a small roller *v*, attached to the carriage, as it passes over the rails in succession, holds the cloth against each rail for a short space of time, and prevents it from slipping, by which means the cloth descends in folds or loops between the rails, and is thereby made to hang in a series of folds or loops, as shewn in both figures.

It will be perceived that as the pivots of the cloth roller *f* bear upon inclined planes, the roller will continually slide down as the cloth diminishes in bulk, keeping in contact with the drum *o*, and delivering the cloth from the roller *p*, on to the several rails, as described.

In order to stop the carriage in any part of its course, or to adjust any of the folds of the cloth, a man is usually placed upon the platform *u*, travelling with the carriage, over which he has perfect command. This apparatus may be also employed for taking the cloth, when dried, off the rails; in which case the carriage must be made to travel backwards, and by first guiding the end of the cloth on to the roller *f*, and then putting the wheels in a retrograde motion, the cloth will be progressively coiled upon the roller *f*, in a similar way to that by which it was uncoiled.

[*Inrolled, June*, 1823.]

To ROBERT WINTER, *of Fox Court, in the City of London, Esquire, for an improved Method of conducting the Process of Distillation*

[Sealed 22d April, 1823.]

THE patentee states, that by the present modes of distillation, the vapour, on leaving the still, enters the condenser immediately, where it is condensed into what is technically called low wines and faints, and that it is necessary the operation should be repeated several times, in order to obtain the whole of the spirit in a high state of rectification; his object, therefore, in the present improved process, is to produce the spirit in a perfect and highly rectified state at one operation, for which purpose an apparatus is proposed, similar to that shewn in section, in Plate XIV, fig. 3.

The explanation of this apparatus is by no means clear in the specification, but if we understand the patentee's intention, the operation is as follows:—The vapour from the still passes from the pipe *a*, into a chamber *b*, from whence it ascends through the perpendicular tube *c*, and there descends again through the pipes *d d*, into the chamber *e e*, which is separated from the chamber *b*, by a flat plate; in this flat plate there are two or more bent pipes, through which the condensed part of the vapour flows into the chamber below, and by the form of these pipes, the liquor is enabled to run through, but not the vapour or air to ascend, as the liquor in passing forms a sort of hydraulic valve in the bend. The vapour proceeds from the chamber *e*, through the pipe *f*, into the second receiving vessel, from whence it ascends by very contracted passages *g g g*, into the upper chamber *h*, and thence through the pipe *i*, to the worm of the condenser. These passages are formed by a series of concentric cylinders one within the other, and the passages are not to exceed half an inch in width.

The peculiar feature of this apparatus is, that the whole of the chambers and pipes are immersed in hot baths; that is, they are inclosed in water tight vessels, and surrounded with hot water. The temperature of the water in the first vessel is to be as high as 170 Fahrenheit; that of the second vessel lower. In order to expose the vapour as much as possible to the heat of the bath, the pipes *d.d*, are proposed to be formed as flat ovals, and the passages *g g g*, may be either separated by zig zag partitions, so as to retard the progress of the vapour, or the passages may be made to run round the cylinders as worms.

The hot water is made to surround the passages of the concentric cylinders by flowing from the top part of the second vessels through the pipes *j j*, and also through similar pipes below. The apparatus is proposed to be made of copper tinned, but no dimensions need be named, as they would depend upon the capacity of the still, and condensing apparatus to which it may be attached.

[*Inrolled, September*, 1823.]

To JOHN WARD, *of Grove Road, Mile-End Road, in the County of Middlesex, Ironfounder, for his Invention of certain Improvements in the Construction of Locks, and other Fastenings.*

[Sealed 13th November, 1823.]

THESE improvements consist principally in the adaptation of certain mechanical contrivances, by which one lock placed in the usual part of a door, or in the lid of a chest, shall be enabled to shoot out bolts at the ends, or at the top and bottom. Plate XIV. fig. 4, represents the principal lock, and the auxiliary locks or bolts at the ends; the face plates being removed for the purpose of shewing their interiors. The principal lock is furnished with tumblers in order to prevent its being picked; but these do not materially differ from the tumblers of other locks. It is necessary to introduce two keys to move these tumblers, and shoot the bolt. Upon the face of the bolt there are two studs *a a*, which as the bolt advances strike against the inclined planes of the levers *b b*, and thereby raise those levers. At the back of the levers *b b*, are the ends of the rods *c c*, and these rods extend to the auxiliary locks or bolts, at the top and bottom corners of the door. The auxiliary locks consist each of a simple bolt pressed back by a spring, and moved forward by a bent lever, against which the extremity of the rod *c*, acts; hence it will be seen that the shooting of the bolt in the principal lock causes the levers *b b*, to rise and drive the rod *c* outward, by which means the back levers of the auxiliary locks force their bolts out also, and lock the door both at the ends and in the middle.

The bolts of the auxiliary locks, after being thus projected, may be fastened in that situation by small secret sliders on the side, which fall into notches in the bolts, and when this is done, the unlocking or throwing back of the principal bolt will not carry the auxiliary bolts back also, but the door will remain fastened at the ends. If, however, these small bolts are not secured by the sliders, the return of the principal bolt will enable the levers *b b*, and the rods *c c*, to fall inwards, by which means the springs will exert themselves, and force the bolts back.

The particular form and disposition of the tumblers, necessarily induce a peculiarly formed key, which has a falling ward that moves upon a joint in the end, but as the tumblers are of course not intended to be exactly similar in every lock, the form of the wards of the key must vary likewise. This falling ward is, however, claimed as new, and so is the peculiar disposition of the tumblers, but the principal feature is the manner of shooting the bolts of three distinct locks at one turn of the key.

A small door-latch, or bolt, fig. 5, is also claimed as new; it consists of a bolt *a*, with two notches on the upper side, into one of which the end of the lever *b* is forced by a spring. When the bolt is shot out, as in the figure, the end of the lever drops into the posterior notch, and the bolt cannot be sliden back, or the door opened, without first raising the lever; this, however, is done by a small knob on the outside, when the bolt, being slidden back by a knob affixed to it, the door is opened, and the end of the lever drops into the other notch.

[*Inrolled, December,* 1823.]

To CHARLES MACINTOSH, *of Crossbasket, in the County of Lanark, Esquire, for a Process and Manufacture, whereby the Texture of Hemp, Flax, Wool, Cotton, and Silk, and also Leather, Paper, and other Substances, may be rendered Impervious to Water and Air.*

[Sealed 17th June, 1823.]

THE process of manufacturing water-proof articles described herein, consists in joining the surfaces of two pieces of cloth, silk, or other material together, by means of a flexible varnish, which is to be made of caoutchouc (Indian rubber) dissolved in the oil extracted from the distillation of coal.

The caoutchouc, in order to be dissolved, is to be cut or shaved into very thin shreds, and then steeped in the coal oil; heat may be added by the employment of a steam bath surrounding the vessel in which it is placed, and the thick varnish produced is to be strained through a sieve of wire or horse-hair. About twelve ounces of caoutchouc, cut as above said, may be dissolved in about a wine-glass full of the coal oil, but these proportions will depend upon the quality of the caoutchouc, and also of the oil.

The cloth, silk, or other material to be rendered waterproof, must be strained upon a frame, and then covered with a coat of the elastic varnish, by means of a brush; when the varnish has sufficiently set upon the cloth, or other material, to become sticky, another piece of similar cloth, also prepared with the varnish, is to be laid upon the first, the varnished surfaces being placed face to face, and, to assist the adhesion of the two pieces so laid together, they are to be passed between a pair of plain rollers, and afterwards dried in a warm room, which, when completed, will be found to have so perfectly united the fabrics, that it would be impossible to separate them again.

The cloth, silk, or other material so prepared, will be found perfectly impervious to both water and air, and from its flexibility may be conveniently employed as a light outer garment, or for any other purpose where water-proof coverings are required.

[*Inrolled*, *December*, 1823.]

NOTICE.

In this volume we have completed the reports of all the patents specified in the year 1823. Some of these reports have been protracted beyond the time they may have been expected, but various circumstances, which need not be detailed, have caused the delay; we therefore again request our readers to observe, that none of the specifications inrolled, whatever their merits, are passed by us unnoticed, and though the present year has been prolific in the way of invention, greatly beyond any preceding, yet we hope, by exertion, still to fulfil our pledge, and to report every specification within the year following after its inrolment.

Original Communications.

To the Editor of the London Journal of Arts, &c.

SIR,

THE facilities of intercourse between France and England, having enabled many of your artizans to introduce their valuable inventions here, I have considered that an *exposé* of the French Patent Laws might be acceptable to many of the readers of your extensively useful publication; as a knowledge of these laws may be of service to patentees in England, and prevent inventors who are intending to solicit patents from the French Government, from falling into such errors as might invalidate their privileges. I have therefore forwarded to you a copy of the "LAWS, ARRÉTES, AND DECREES ON BREVETS OF INVENTIONS, IMPROVEMENTS, AND IMPORTATIONS."

I am, Sir, yours,
C. ALBERT.

28, Rue Neuve, St. Augustin, Paris.

[TRANSLATION.]

The National Assembly, considering that every new idea, the development of which can be made useful to society, belongs in the first instance to him who has conceived it, and that it would be to attack the rights of man in their essence, not to regard every useful discovery as the property of its author; considering at the same time how much the circumstance of not making an authentic declaration of this truth may have contributed to the discouragement of French industry, and to the emigration of many distinguished artists, and that all the principles of justice, public order, and national interest, imperiously require that French citizens should enjoy the advantage of fixed principles relative to this kind of property, by a law which secures and protects it, DECREE AS FOLLOWS:—

Every discovery or new invention is the property of its inventor, the law therefore secures to him the full advantages of it, for the time and in the manner about to be described.—Every addition which is an improvement to an invention, shall entitle its discoverer to the same privileges as the original inventor. Whoever shall first introduce into France a foreign discovery shall enjoy the same advantages as if he had been its author; and he who wishes to avail himself of the privileges and powers conferred by the present law must conform to the following rules:—

He must address to the Secretary of the Directory of his department a statement in writing, whether the object he presents is his invention, his improvement, or only an importation. He must deposit, under seal, a full account of the principles and process of the discovery, also plans, designs, or models, describing and illustrating it.

When inventions of general utility are so simple in their execution, or so easily imitated, as to render them unfit for any commercial speculation, and in every case in which the inventor would prefer treating directly with the government, he shall be at liberty to address himself either to the Administrative Assembly, or to the Legislative Body, to confide to them his discovery, demonstrate its advantages, and solicit a recompence. When an inventor shall prefer to the personal advantages assured to him by a patent, the honor of conferring upon the nation, the immediate benefits of his discovery, and shall prove by public notoriety, and by legal attestations, that it is of real utility, a recompence may be granted to him, out of the funds destined for the encouragement of industry.

In order to secure to every inventor the advantages and the temporary property in his invention, he shall have an exclusive title or patent given to him, according to the form stated in the rule which shall be prepared for the execution of the present degree. The patents are to be granted for FIVE, TEN, or FIFTEEN YEARS, at the choice of the party soliciting, but the latter term cannot be prolonged without a decree of the Legislative Body.

The exercise of patents granted for discoveries imported from foreign countries, cannot extend beyond the time specified in the preceding article.

The specification, after being engrossed on parchment, and sealed with the national seal, is to be inrolled in the office of the secretary of the department, and the patent may be obtained by addressing to the directors, who will procure it for the inventor. Every citizen shall be at liberty to apply to the secretary of his department, for the inspection of the catalogue of new inventions, and every resident citizen may consult at the general depôt, established for this purpose, the specifications of the patents actually in use, excepting in cases where the inventor has judged it important, either for political or commercial reasons, to keep his discovery secret, and shall have laid his reasons before the Legislative Body, and have obtained a particular decree for this object. In this case, commissioners shall enquire into the fidelity and exactness of the description given, after inspecting the process.

The proprietor of a patent, shall enjoy exclusively the advantages of the invention, discovery or improvement for which a patent shall have been obtained; he may consequently, upon giving sufficient security, obtain the seizure of whatever constitutes an invasion of his patent right, and may call before the tribunals those who shall counterfeit it, who, if convicted, shall be condemned to pay to the inventor, a sum proportioned to the injury his interests have sustained, and one-fourth of this sum to the poor box of the district; but this amount can never exceed 3000 livres, except in the case of a second offence, when it is doubled.

If in consequence of the declaration of an infringement, a seizure shall have taken place, and the proof be found inefficient, the inventor shall be condemned to pay to the defendant damages proportioned to the trouble and injury which have been occasioned, and shall, besides, pay into the poor box of the district, a sum equal to one-fourth of the damages claimed, which shall not exceed 3000 livres, except in the case of a second offence, when it shall be doubled.

Every patentee shall have the right of forming establishments in any part of the kingdom, and to authorize any other person to carry on his processes, and to dispose of his patent like any other property.

At the expiration of each patent the description shall be made public, and its use permitted to every citizen, unless a decision of the legislative body shall adjudge that the invention shall be longer kept secret, as in the cases alluded to above.

The description of the discovery or invention contained in a specification, and the use of the means and processes shall be free to all the kingdom when the right of the patentee expires, which shall take place at the end of the specified terms, or under the following circumstances; (viz.)

"Every inventor who shall be convicted of having given a description which shall conceal the true process, or any part of it, or be convicted of making use of secret means, not detailed in his description, or should use any which he does not afterwards add to his description, shall lose his patent. Every patentee who shall be convicted of having obtained a patent for an alledged discovery which has been already described in works printed and published, shall lose his patent. Every inventor who shall not for two years from the date of his patent, have made use of the discovery for which he has obtained it, or shall not give satisfactory reason for having neglected so to do shall lose his patent. Every inventor who having obtained a patent in France, shall be *convicted* * *of taking out one in another country for the same object*, shall lose his patent. He who acquires by the purchase of a patent, the exclusive right of using any discovery, shall be subjected to the same obligations as the inventor, and if he acts contrary to these, his patent shall be revoked.

The National Assembly has no desire to avail itself of any of the advantages derivable from discoveries or inventions, as long as *the patentees conform to the rules laid down.*

The Government charges for a patent in France are,

For a term of	FIVE years	300 livres
—— Ditto	TEN	800
—— Ditto	FIFTEEN	1,500

. This law does not apply to the patentee, when *another person* takes out a patent for the same invention in a foreign country. *Editor.*

For the addition of improvements to be introduced into an existing patent . . .	24 livres
For the prolongation of patent right, when granted by the legislative body	600
For inrolment of the specification (of which a duplicate must be deposited)	12

Beside these, there are, for engrossment of the *proces verbal*, for fees to officers, and other incidental charges, some small sums to be paid in addition to the government duties.

Extract of a private letter from an Engineer, at New York, on the present Improved State of the Arts and Sciences in the United States of America.

SINCE my return to the United States, the spirit of improvement has been extended in an astonishing manner in the several branches of agriculture, manufactures and navigation. Agricultural societies have sprung up in almost every part of the country, whose objects are to foster a spirit of enterprize for experiments in every department of husbandry and domestic manufactures; the effect has been very perceptible. In the eastern, middle, and western states, manufactures of various kinds, have been established, and are going on very successfully and profitably; of which cotton is by far the most extensive. About one-sixth of the cotton raised in the United States is worked up here, much of it in a very superior style; woollen cloths of various descriptions, are manufactured in several of the states, of as good a quality as the best imported.

The article of iron is manufactured extensively, and every year large accessions are made to the capital employed in this department; many articles of cutlery are also manufactured in an excellent quality. Globes, optical, mathematical, and philosophical instruments; glass ware of a good quality, and cut glass. Porcelain is also made in this city, I do not know how good, but it is probable as the establishment is new, that it is not so good as elsewhere; all kinds of furniture is made in a style of elegance not surpassed; musical instruments, carriages, and other articles, many of which go to the West Indies and South America.

The sciences are studied extensively, in all the branches of which are to be found able professors, and literature has many votaries; here are also some respectable authors. Polite education of both sexes is very general, and a taste for the fine arts is rapidly making its appearance as in England, among the middle class of society. Drawing and painting is attended to in all respectable schools, in many of which I think, a degree of proficiency has been manifested much beyond what might have been anticipated.

In the general scope of improvement, public works fully keep pace; in this State four hundred miles of canal have been completed in seven years, at a cost of about ten million of dollars, and in other parts similar works are still going on. We are now exploring for a new canal from Ogdensburgh, on the St. Lawrence, to Lake Champlain; in New Jersey; a canal route of seventy-five miles has lately been explored, and another of a capacity sufficient for coasting vessels, is in contemplation in Pennsylvania; the Schuylkill canal, about one hundred miles, has just been completed, and another (the Union) of about seventy-five miles, is half done. In Delaware a thorough cut of about seventeen miles, to unite the Delaware and Chesepeak, has been commenced, and will be completed in three years—nine feet deep, and fifty wide, with locks at each end large enough to pass coasting vessels and steam boats. In Ohio a canal line has been explored from Lake Erie to the Ohio river, which it is probable will soon be commenced. In Virginia they are making a canal of about two hundred and fifty miles in length, which is about one third done. I have been in Alabama, and explored one entire line of about twenty miles, for which they are now getting funds to go on. I shall leave this city in a few days to go on exploring for another canal in the same State, along the valley of Tennessee river, of capacity sufficient to pass steam boats.

J. M.

Novel Inventions.

The great Timber Raft from Canada.

THIS raft, or rude vessel, called the Columbus, was built for the express purpose of conveying a great quantity of timber at once: her length of keel is 294 feet; length of deck, 301 feet; breadth of beam, 51 feet 4-12; depth of hold, 29 feet 4-12; from the top of her bulwarks to the bottom, outside, 37 feet; tonnage, 3,690 tons; mainmast above deck, 72 feet; best bower cable, 27 inches; anchor, 80 cwt. 2 qrs. 17 lbs. She is perfectly flat bottomed, with a keel of about 12 inches, wall-sided, sharp forward, and rather lean aft. She admeasures 3,900 tons, but her cargo amounts to 6,300 tons.

The Columbus is unquestionably the longest ship ever seen in England, but her appearance, in every other respect, is far inferior to that of one of our large Indiamen: her construction is quite new for a very large vessel; she is flat-bottomed, and her bottom two feet wider than her deck; her planks and timbers throughout are on a scale of thickness proportioned to her great length, and fastened together with proportionate strength. It is not true, as was stated in some accounts of her, that her cargo (red and white pine) was fastened into her timbers in the building; it is stowed away in the same manner as on board other ships timber laden. In her masts, spars, and rigging, the Columbus presents an appearance not at all proportioned to her rate of tonnage; they are not larger than those used in a small frigate. She left Quebec on the 5th September, and continued her course in safety till the 9th, when she got ashore on the north side of the river St. Lawrence, from Point des Betsiamites, and was not got off till the 12th, when, for the purpose of lightening her, a considerable quantity of timber, deals, and staves, were obliged to be thrown overboard.

After a very boisterous passage across the Atlantic, she made the Scilly Light on the evening of the 29th of October, all the pumps having been kept constantly going for a week before making the land, to the great exhaustion of the crew, who were only ninety-six in number. To encourage them to maintain this harassing labour, a guinea extra upon the wages of each man was promised, and it is supposed, but for this inducement, the vessel would never have reached her destination. During the voyage the leak gained from eight to eleven feet water; and when in the river there was no less than eighteen feet water in the hold. In consequence of this she lay deep in the water, drawing twenty-three feet, and standing only fifteen feet above the water's edge. She reached the

Downs on the 1st of November, and was afterwards towed up to Blackwall by the steam-boats. The following description of this great vessel, though somewhat technical, is so correct, that we quote it from the *New Times* paper.

"This vaunted Colossus of the deep is at length accessible to the investigation of the curious, however timid they may be, and the lovers of sight-seeing may gratify their whim and fancy, without encountering a heavy sea, a fearful lee-shore, or blue-water banyan days. Thanks to pilots, steam-boats, &c. the Columbus is now off Folly House, in Blackwall Reach, where she is likely to be easy in her berth, without moorings or even a kedge. Her arrival has excited so much interest and conversation, that though we have already given her dimensions, the nature and quantity of her cargo, and some account of her appearance, and how she behaved at sea, we are induced to recur to the subject, and speak from 'ocular demonstration.'—This Columbus is extremely deceitful in her appearance, especially when she is seen end on; she scarcely looks half her size. She is like a wedge forward, has no cutwater, is wall-sided, carries her beam we should imagine to abaft the second main-mast, for she has four masts, and has a square tuck. Her run is very gradual, and from her length she looks extremely lean. From deck to keel, we believe, she measures about thirty-five feet, and as she draws above twenty-two feet, she sits low in the water. A tolerable sized light West Indiaman, or a thirty-eight-gun frigate in cruising trim, appears almost as lofty in the hull when you are alongside. At a broadside view from a distance, the Columbus looks a tremendous length, and though seemingly hoged or broken-backed, and very much under-rigged, there is something sneaking and dangerous in her shew. As you approach her, however, she looks as she is—an immense mass of timber knocked together for the purposes of commerce, without any regard to beauty, and little attention to the principles of naval architecture. She has two sets of beams, the upper ones, which sustain the deck, project through the sides. She has also an inner frame, for the better security of the cargo—to prevent any starting of the timber. Her blocks were laid in October, 1823; she is perfectly flat-bottomed, and her shell was completely built before a plank of her cargo was stowed. Previous to her being launched, however, 4,000 tons of timber were run on board by horses, through the bow and stern ports, and she drew about thirteen feet when she first sat on the water.

"Unlike large ships, her galley and bitts are above deck; and between the foremast and the first mainmast there is a fore hatchway, and a cable tier and messing-place for part of the crew, which look like a rude gap made in her cargo after it had been stowed. The height from the timber on which the cable is coiled, and where the men have two or three berths, is about six feet; so that there must be even there about thirty feet deep of timber. But from the first mainmast to the second, the cargo runs from deck to kelson, and abaft the latter mast, close to the wheel and mizen or treysail mast, where the binnacles stand, is a place for the accommodation of the officers and the rest of the crew. The provisions, we believe, are stowed abaft the treysail mast. Her rudder is hung like that of any other ship, but its head comes above the taffrail, and the tiller is above deck.

"A great deal of the timber she has on board was, we understand, fresh hewn—it now looks extremely wet—it is principally red pine, and, like most Canadian timber, it runs large and long. The rigging of the Columbus was naturally a minor consideration with her owners; and though it has answered the purposes for which it was intended, it presents nothing worthy of commendation to the eye of a seaman, and nothing striking to that of a landsman. The masts are ill-proportioned for beauty, and injudiciously so, as far as the labour of the crew is concerned. The lower masts are too taunt—there is too much of them above deck, and this necessarily gives the courses a tremendous drop. One of the crew, an intelligent sailor-like man, said the fore-sail had fifty feet leech. The bowsprit and jib-boom are but one spar; they steeve little, and the hoist of the jibs is consequently great. The topmasts and top-gallant masts are also in one; they are exceedingly short, and a royal can only be set on one of the mainmasts. She is not more square-rigged than she is taunt; her fore-yards do not measure above 70 feet. The only studding sails she carried were topmast ones on the first mainmast. Her topmast rigging is rove through holes in the cross trees, and is set up with lanyard to a grummet round the lower mast. There are, therefore, no cat-harpings, and the rest of the rigging is of the same temporary speculative description. Her hemp cable measures twenty-six inches in circumference, and the chain is in proportion.—She crossed the Atlantic with a single bower anchor, and a kedge of about 7 cwt. It is said she worked easily and surely; that she was perfectly under the government of her rudder; that she was in general steered with facility by a man and a boy; that she went from nine to ten knots an hour, when sailing free, and that at six points and a half from the wind she went six knots, and made but little lee-way. In a sea-way she was of course heavy, and shipped much water, as she could not rise, from her great length and want of beam. In fact, she could have been but as a log of wood in a short chopping sea, one of which might have broken over her mid-ships almost without any body forward or aft knowing of the circumstance. We are, however, rather sceptical as to whether we should conclude that she is actually possessed of all the good qualities attributed to her. We cannot believe that she ever sailed at six points and a half, or at even seven points from the wind, or that she ever went nine or ten miles an hour. We do not think that a square sail in her would stand at six points and a half, and she has no buttock for running. On the whole, however, she is an extraordinary piece of workmanship; and though vastly inferior to a first, second, third, or fourth-rate man of war, in beauty and capacity, the Columbus is well worth visiting. We think, however, that a *bear* and *swab*, if not a *holy-stone*, would improve the appearance of the deck extremely."

Polytechnic and Scientific Intelligence.

Astronomical Society of London.

THIS society held its first meeting after the summer recess, on Friday 12th of November, the President. H. T. Colebrooke, Esq. in the chair. Several new members were elected, and others proposed, and a great number of valuable presents, especially from foreign astronomers, were announced.

Two communications were read from Sir Thomas Brisbane, Governor of New South Wales:—the first of these contained an account of some observations made at Paramatta, by Sir Thomas and Mr. Dunlop, on the inferior conjunction of Venus with the Sun in October last. The observations were made with a mural circle of Troughton's, which Sir Thomas characterizes as of remarkable steadiness, and so well in the meridian, that with Antares and γ Draconis, and any other of the high and low stars, it gives the same right ascension. The observations extend from the 1st to the 25th of October. The account exhibits the Polar distances, and the times of culmination of the Sun and Venus, as well as of Antares, β Argo, and α Lyræ, to show the state and position of the instrument.

The latitude of the observatory at Paramatta is stated to be 33° 48′ 43″ S., longitude, east of Greenwich, 10h. 4m. 5s.

Sir Thomas's second communication, which is dated 17th April, 1824, contains, first, a record of repetitions on the Sun with Reichenbach's circle, for the summer solstice 1823; they extend from December 10th, 1823, to January 2nd, 1824, but have not yet been subjected to the necessary reductions for a definite result. Secondly, a series of observations on several stars, made at Paramatta, with the mural circle, from November 20th, 1823, to February 19th, 1824. Twenty of the stars observed are among those whose places are given annually in the Nautical Almanack, and are usually denominated Greenwich stars.

A letter was also read from Baron Zach to Francis Baily, Esq., dated Genoa, 31st July, 1824, announcing the discovery of a telescopic comet, by M. Pons, on the 24th of that month. It was in the head of Serpentarius, without tail, or coma;—a simple nebulosity. M. Pons's observations on the comet, and some stars near it, from the 25th to the 28th July, accompany this communication, but as the comet was even then rapidly approaching the sun, they need not now be recorded.

Mr. Herschel submitted to the inspection of the members present a new double image micrometer by Professor Amici of Modena. The duplication of the image in this ingenious instrument is effected by interposing a divided concave lens, of very long focus, between the object and eye-glasses of a refracting, or between the mirror and eye-glass of a reflecting, telescope. The separation of the centres of the two segments is performed by a rack and pinion, sliding them on one another, their edges being preserved in contact, and is measured on a divided scale with a vernier in the usual manner. It is obvious that each segment will form a separate image of a distant object, more remote from the object end of the telescope than its principal focus, and the value of the parts of the scale is easily had from the expression $1'' \times \frac{\phi \phi'}{\phi - \alpha}$ or $0{,}0000048481 \times \frac{\phi \phi'}{\phi - \alpha}$, where ϕ is the focal length of the object lens or mirror, ϕ' of the bisected lens, and α the distance of the latter from the former: all expressed in parts of the same scale, into which the micrometer is divided. This expression gives the number of parts of such scale, which represent $1''$ of angular measure, and conversely, the value of one part of the scale in seconds will be the reciprocal of this fraction. This micrometer possesses several advantages, among which may be reckoned—simplicity of construction and use, the magnitude of its scale, which may be increased to almost any extent by an increase of the focal length of the bisected lens (ϕ'), and lastly the advantage of dispensing with a table of reduction by so fixing the place of the divided lens as to render one part of the scale correspondent to $1''$ of angular measure. In fact, if we equate the above expression to unity, we get $\alpha = \phi \left\{ 1 - 0{,}0000048481 \phi' \right\}$, and if this be the distance of the divided lens from the object glass, one part of the scale will correspond to one second. Mr. Herschel, in his visit to Modena, in the spring of the present year, had an opportunity of trying this instrument as applied to celestial objects in one of M. Amici's superb reflecting telescopes of twelve inches aperture and eight feet focus. The following, among other measures were taken:—viz.

Distance of the two stars of Polaris (single measure)	18″.40
Jupiter—Polar diameter (mean of six measures) . . . . , . .	32″.54
Equatorial ditto (ditto)	34″.06
Consequent ratio of diameters . .	1.0467

Mr. Donkin laid on the table, for the inspection of the members, an instrument made by M. Fatton (a pupil of Breguet's at Paris) for determining the *fractional part* of a second of time, in astronomical observations. This piece of machinery is about five inches in diameter, and somewhat larger than the ordinary size of ship chronometers. The instant of observation is marked by a very fine point attached to a spring, (which by means of a peculiar kind of ink,) makes an impression on the dial plate. The machine will go for five hours. It is impossible to enter into any further description of this ingenious piece of mechanism, without the assistance of plates and numerous references, but we hope the inventor will be induced to lay the whole before the public at no distant period.

Prize Questions proposed by the Astronomical Society of London.

This society has just proposed the following prize questions to the consideration of astronomers and mathematicians, viz.:—

1st. The silver medal, to any person who shall contrive and have executed an instrument, by which the relative magnitude of the stars may be measured or determined, and of which the utility for this object shall be sufficiently established, by numerous observations and comparisons of known stars.

2nd. The gold medal, for approved formulæ for determining the true places of either of the four newly-discovered planets, Ceres, Juno, Vesta, and Pallas, within such limits as the council may think sufficiently correct for the present state of astronomy. Such formulæ, in each case, to be accompanied with comparisons of the observed places, at various periods.

3d. The gold medal, for a new mode of developing the differential equation for expressing the problem of the three bodies, by which a *smaller number* of tables shall be required, in order to compute the moon's place to the same degree of accuracy as by any existing tables, and with greater facility.

To be entitled to competition for the prizes, all answers to the first question must be received before the 1st February, 1826; to the second, before the 1st February, 1827; and to the third, before the 1st February, 1828.

New Patents Sealed, 1823.

To Joseph Apsden, of Leeds in the county of York, Bricklayer, for his new invented improvement in the mode of producing an artificial stone.—Sealed 21st October—2 months for inrolment.

To George Dodd, of Saint Anne Street, Westminster, in the county of Middlesex, Engineer, for his invention of certain improvements on fire extinguishing machinery.—Sealed 21st October—Six months.

To George Samuel Harris, of Caroline Place, Trevor Square, Knightsbridge, in the county of Middlesex, gentleman, for his new invented machine for the purpose of giving the most effectual and extensive publicity by day and by night to all proclamations, notices, legal advertisements and other purposes, to which the same may be applicable, destined for universal information, and which will henceforward render unnecessary the defacement of walls and houses in the metropolis, and its vicinities, by bill-sticking, placarding, and chalking, which latter practices have become a great and offensive public nuisance.—Sealed 21st October—2 months.

To John Lingford, of the Town and county of Nottingham, lace machine manufacturer, for his invention of certain improvements upon machines or machinery, now in use for the purpose of making that kind of lace, commonly known or distinguished by the name of bobbin net, or Buckinghamshire lace net.—Sealed 1st November—6 months.

To the Reverend John Somerville. A.M. Minister of the parish of Currie, in the county of Edinburgh, for having invented, devised and discovered a method or methods, applicable to fowling pieces or other fire arms, by which method or methods all accidental discharge of the said fowling pieces or other fire arms will be completely prevented.—Sealed 4th November—2 months.

To John Crosley, of Cottage Lane, City Road, in the county of Middlesex, gentleman, for his invention of a contrivance for better insuring the egress of smoke and rarefied air in certain situations.—Sealed 4th November—6 months.

To Thomas Richard Guppy, of Bristol, gentleman, for his invention of certain improvements in masting vessels.—Sealed 4th November—6 months.

To John Head, of Banbury, in the county of Oxford, Hosier, (being one of the people called Quakers) for his invention of certain improvements in machinery, for making cords or a plat for boot and stay-laces, and other purposes.—Sealed 4th November—4 months.

To William Church, of Birmingham, in the county of Warwick, Esq. for his invention of certain improvements on augers and bits, for boring, and in the apparatus for making the same.—Sealed 4th November—6 months.

To William Busk, of Broad Street, in the city of London, Esq. for his invention of certain improvements in propelling ships, boats, vessels, or other floating bodies.—Sealed 4th November—6 months.

To John White the younger, and Thomas Sowerby, both of Bishop Wearmouth, in the county of Durham, merchants, for their new invented improved air furnace, for the purpose of melting or fusing metallic substances.—Sealed 6th November—4 months.

To John Moore, of Broad Weir, in the city of Bristol, gentleman, for his invention and discovery of a certain addition or additions to, or an improvement or improvements upon the steam-engine or steam-engine apparatus.—Sealed 6th November—6 months.

To Thomas Cartmell, of Doncaster, in the county of York, gun maker, for his invention of an improved cock to be applied to the locks of guns, pistols, fire arms or ordnance, for the purpose of firing the same by percussion, acting either by self-priming or otherwise, and whereby the priming is rendered wholly impervious alike to the wind, rain, or damp.—Sealed 6th November—2 months.

To Charles Heathorn, of Maidstone, in the county of

Kent, lime burner, for his invention of a new method of constructing and erecting a furnace or furnaces, kiln or kilns, for the more speedy, more effectual, and more economical manufacture of lime, by means of applying, directing and limiting or regulating the flame and heat arising in the manufacturing or burning coal into coke, and thus making lime and coke in the same building and at the same time.—Sealed 11th November—2 months.

To William Leathy, of Great Guildford Street, in the Borough of Southwark, engineer, for his invention of various improvements in machinery or apparatus used in the making of bricks, and certain improvements in the drying of bricks by the means of flues and steam.—Sealed 11th November—6 months.

To Pierre Brunet, of Wimpole-street, Cavendish-square, in the county of Middlesex, merchant, in consequence of a communication made to him by a certain foreigner residing abroad, with whom he is connected; he is in possession of an invention of a furnace made upon a new construction.—Sealed 11th November—6 months.

To Joseph Clisild Daniell, of Stoke, in the county of Wilts, clothier, for his invention of certain improvements in dressing woollen cloth.—Sealed 20th November—4 months.

To Isaac Taylor. junr. of Chipping Ongar, in the county of Essex, gentleman, for his new invented cock or tap for drawing off liquids.—Sealed 20th November—2 months.

To William Rhodes, of Baulins Hoxton, in the parish of Hackney, in the county of Middlesex, brick maker, for his new invented improvement in the construction of clamps for burning of rain bricks.—Sealed 20th November—6 months.

D.	H.	M.	S.	
1	0	0	0	⊙ dec. 21° 52′ 6″ S.
1	8	16	0	☽ passes the meridian.
2	2	0	0	☽ in conj. with η in Pisces
3	9	0	0	♀ in conj. with ♅ long 14° in Cap. ♀ lat. 1° 46′ S. ♅ lat. 24′ S. diff. lat. 1° 22′.
4	6	0	0	☿ in conj. with B in Oph.
4	16	0	0	☽ in conj. with η in Taurus.
5	13	5	47	♃'s 2nd. Sat. will immerge.
5	22	25	0	Ecliptic opposition ○ full moon.
6	0	0	0	⊙ dec. 22° 32′ 54″ S.
6	12	32	0	☾ Passes the meridian.
7	4	0	0	☾ in conj. with η in Gemini.
7	7	0	0	☾ in conj. with μ in Gemini.
7	13	40	11	♃'s 1st. Sat. will immerge.
7	23	0	0	☾ in conj. with ζ in Gemini.
8	6	0	0	☾ in conj. with δ in Gemini.
10	14	0	0	☾ in conj. with ξ in Leo.
10	18	0	0	☾ in conj. with ο in Leo.
11	0	0	0	⊙ dec. 23° 2′ 41″ S.
11	3	0	0	☾ in conj. with π in Leo.
11	17	5	0	☾ passes the meridian.
12	15	41	27	♃'s 2d Sat. will immerge.
12	19	44	0	☾ in □ last quarter.
14	15	33	28	♃'s 1st Sat. will immerge.
15	14	10	37	♃'s 4th Sat. will immerge.
15	18	37	17	♃'s 4th Sat. will emerge.
16	0	0	0	⊙ dec. 23° 21′ 3″ S.
16	10	1	47	♃'s 1st Sat. will immerge.
16	21	18	0	☾ passes the meridian.
17	19	0	0	☾ in conj. with δ in Scorpio.
19	0	0	0	⊙ eclipsed, invisible at Greenwich, but will be centrally eclipsed in long. 19° 50′ E. and lat. 33° 8′ S.
19	18	17	17	♃'s 2nd Sat. will immerge.
19	22	40	30	Ecliptic Conjunction ● New Moon.
20	20	0	0	☽ in conj. with 1 γ in Sag.
21	0	0	0	⊙ dec. 23° 27′ 45″ S.
21	0	55	0	☽ passes the meridian.
21	1	0	0	☽ in conj. with ο in Sag.
21	3	0	0	☽ in conj. with π in Sag.
21	6	0	0	☽ in conj. with ♅ long. 15° in Cap. ☽ lat. 1° 22′ N. ♅ lat, 24° S. diff. lat. 1° 46′.
21	8	2	0	⊙ enters Capricornus.
21	17	26	49	♃'s 1st Sat. will immerge.
23	11	55	9	♃'s 1st Sat. will immerge.
24	10	0	0	♂ in conj. with ♀ long 10° in Aquarius, ♂ lat 1° 12′ S ♀ lat. 1° 55′ S. diff. lat. 43′.
26	0	0	0	⊙ declination 23° 22′ 38″ S.
26	4	36	0	☽ passes the meridian.
27	10	0	0	☽ in conj. with ω in Pisces.
28	0	18	0	☽ in □ first quarter.
28	8	37	37	♃'s 3d Sat. will immerge.
28	12	9	34	♃'s 3d Sat. will emerge.
29	11	0	0	☽ in conj. with η in Pisces.
30	10	10	55	♃'s 2d Sat. will immerge.
30	13	48	34	♃'s 1st Sat. will immerge.
31	0	0	0	⊙ declination 23° 5′ 47″ S.
31	8	13	0	☽ passes the meridian.

Rotherhithe.

J. LEWTHWAITE.

ERRATA FOR NOVEMBER.

For 15 12 20 25 ♃'s 3d Satt. will immerge, read emerge.

22 16 18 57 ♃'s 3d Satt. will immerge, read emerge.

For 29 0 0 0 Stationary, read ♃ Stationary.

29 16 45 46 ♃'s 3d Satt. will emerge, read immerge.

METEOROLOGICAL JOURNAL, Oct. and Nov. 1824.

1824.	Thermo.		Barometer		Rain in inches.
	Higt.	Low.	+	−	
Oct.					
26	57	48	29,30	29,20	,05
27	57	44	—,57	—,40	,075
28	58	40	—,60	Station	. .
29	52	41	—,63	29,49	. .
30	49	36	30,06	—,76	,2
31	50	34	—,02	—,74	. .
Nov.					
1	57	37	29,58	Station	,2
2	61	47	—,66	29,49	,025
3	52	39	—,76	—,70	. .
4	47	38	—,74	—,70	. .
5	46	36	—,80	—,67	. .
6	43	24	30,00	—,94	. .
7	60	49	29,89	Station	. .
8	58	49	—,69	29,60	. .
9	50	46	—,93	—,86	,125
Nov.					
10	57	42	29,80	29,70	,025
11	58	49	—,75	—,70	,2
12	51	39	30,10	—,82	,525
13	57	37	—,00	—,60	. .
14	51	40	29,53	—,49	,025
15	48	37	30,00	—,80	,15
16	51	30	—,10	—,90	. .
17	56	47	29,77	—,50	. .
18	56	46	—,60	—,33	,1
19	51	40	—,70	—,60	,15
20	50	37	—,50	—,30	,4
21	52	43	—,40	Station	,775
22	48	37	—,34	29,20	,550
23	51	38	28,60	28,50	,075
24	52	41	29,04	—,90	,075
25	49	37	—,45	29,20	. .

CHARLES H. ADAMS, LOWER EDMONTON.

LITERARY NOTICES.

A DICTIONARY of Chemical and Philosophical apparatus, with plates, has just appeared from the pen of an anonymous writer. Every description of apparatus necessary for the laboratory, or for the experimental lecturer, is here explained, in a familiar manner, and exhibited in the plates, which are got up in a respectable style. The work, though presenting no particular novelty except in its plan, promises considerable usefulness to the young philosopher, as he may here see the different sorts of apparatus used both in chemistry and in the several branches of experimental science connected therewith.

Number IV. of Gems of Art engraved on steel, has made its appearance, containing the "Surprise," from a picture, by Maes, in his Majesty's collection, the "Cottage Door," from Westall, "Arthur and Hubert," from Northcote's picture, with "Morning," from Wilson, and a "Moonlight," after Pynaker; the first and third are executed by T. Lupton, the second by C. Turner, and the two last by J. W. Reynolds, all of which are in the best style of these respective artists.

Mr. Worthington is engraving a picture illustrative of the humorous poem of Cowper, in his best style, from the celebrated picture, painted by T. Stothard, Esq. R. A., it will be ready for publication in the course of December.

Three fragments of Aulus Gellius and Cicero, have, it is stated, been discovered in one of the ancient German Abbeys.

BOTANICAL SCIENCE. — The vital powers of some plants are but little or very imperfectly known. Professor Cazzeri recently presented to the Society of the Georfili of Florence, a branch of the *Cotyledon coccinea* in full vegetation, although it had been detached from the plant sixteen months, and had remained by chance, during the whole of this period enveloped in paper and deposited in a dark place, that was very dry.

SYRIA.—Giovanni Brocchi, the celebrated Italian natural philosopher who was some time back travelling in Nubia, has since his return established himself at Balbec, to superintend the working of a coal mine discovered near mount Libanus. During his travels, M. Brocchi has collected a herbal very rich in rare plants, and his mineralogical collection is not less considerable; he has not however found any curious plants on Libanus, and Anti-Libanus, the vegetation being nearly the same as that of the countries of Sicily and Calabria.

A Narrative of the Condition of the Manufacturing Population from 1817 to 1820, by Alexander B. Richmond, will be ready for publication in a short time.

The Proceedings of the Agricultural Society of the Island of Sumatra, consisting of the first and second reports of the society, is nearly ready for publication.

Part IV. of the Views on the Rhine, by Captain Batty, has just been published; it comprises St. Gudula, at Brussels, a fine and striking subject, rich in ecclesiastical architecture, and most admirably represented, there is also a highly picturesque view at Ober Wesel, also a representation of the Roman Arch, at Tournay, well executed; while the Minne Water at Bruges full of grace and repose, and the Dom-gasse at Wurtzburg, completes a number that reflects the highest credit to the talent of Captain Batty, and is well calculated to keep up the character of this singularly beautiful publication.

LONDON:
SHACKELL AND ARROWSMITH, JOHNSON'S-COURT, FLEET-STREET.

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Wilson's Imp^{d}. Figure Loom.

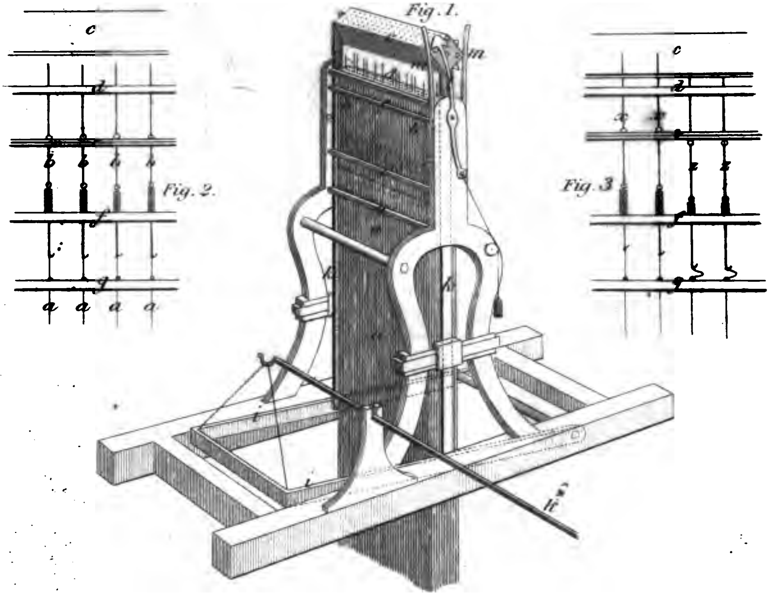


Fig. 1.

Fig. 2.

Fig. 3

Jelf's Machine for cutting marble ornaments.

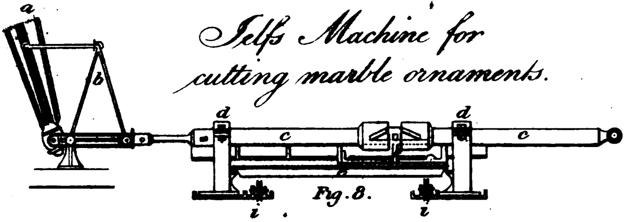


Fig. 8.

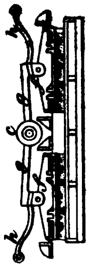


Fig. 9.

Peel's Rotatory Steam Engine.

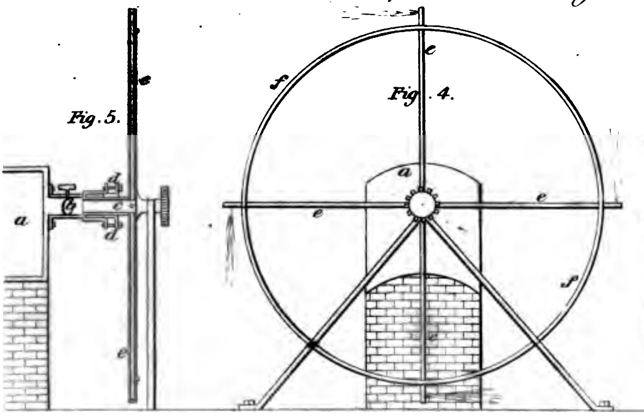


Fig. 5.

Fig. 4.

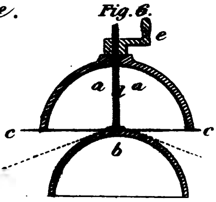


Fig. 6.

Goſset's Preſsing Apparatus.

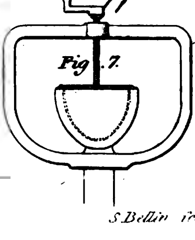
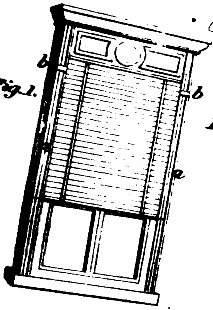


Fig. 7.

W Newton. del^{t}

S Bellin sculp^{t}

Barron & Wilson's Window Blinds.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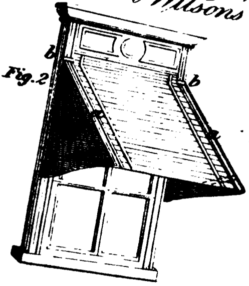
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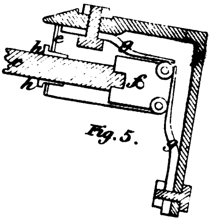
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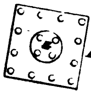
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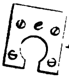
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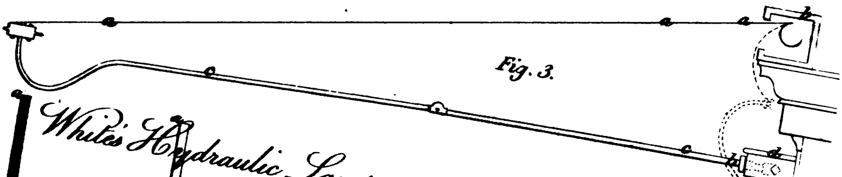
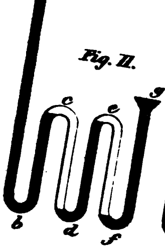


Fig. 3.

White's Hydraulic Lamp.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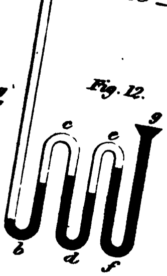


Fig. 12.

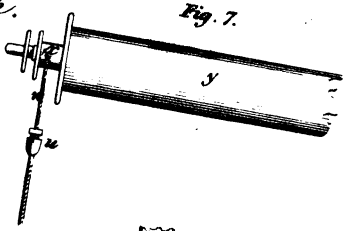
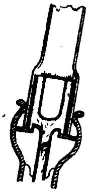


Fig. 7.



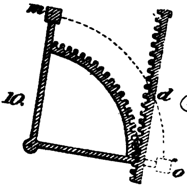
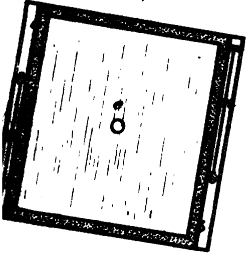


Fig. 10.

Improved Table Lamp.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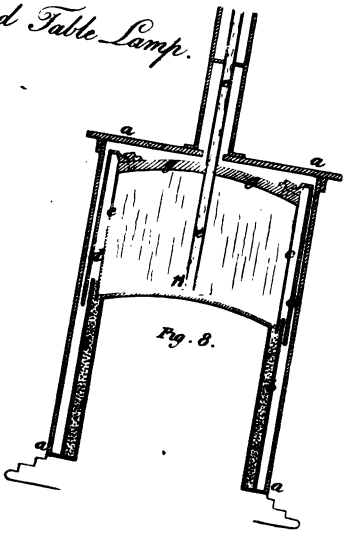
Fig. 8.

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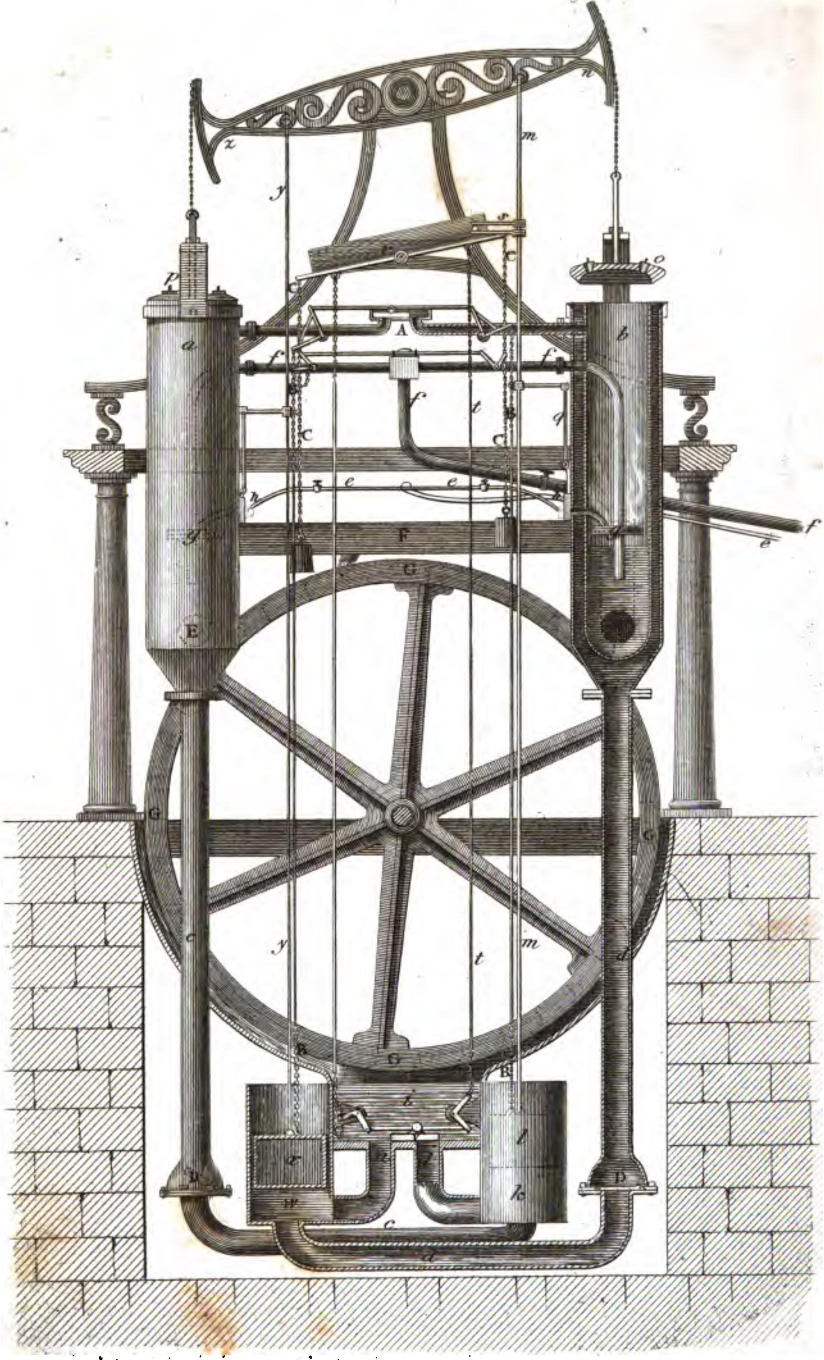
Browns Atmospheric Engine.

PLATE. III.

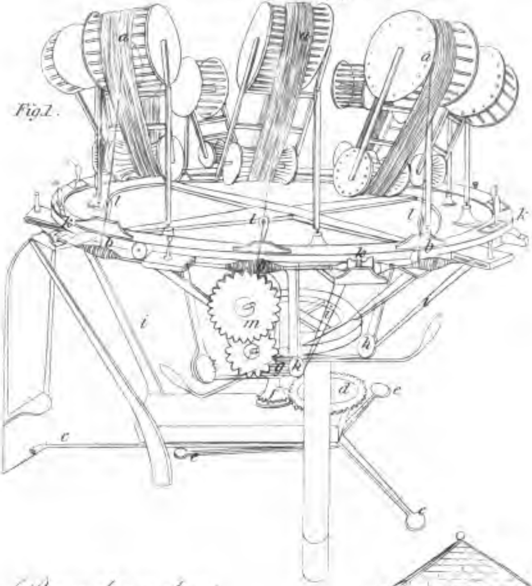


W. Newton del.

S. Bellin sc.

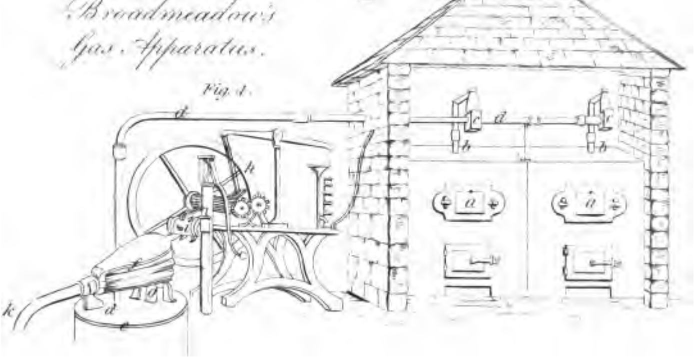
Wilson's Winding Apparatus.

Fig. 1.



Broadmeadow's Gas Apparatus.

Fig. 4.



Pollard's Apparatus for Grinding Colours &c.

Fig. 3.

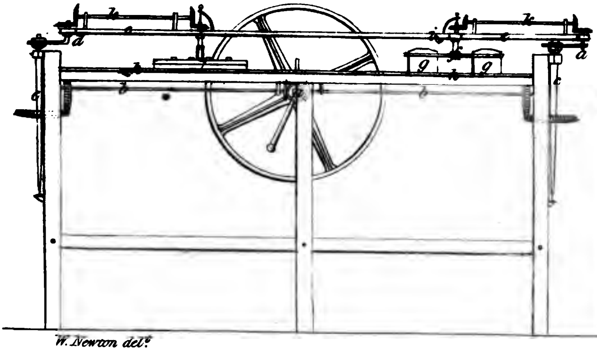
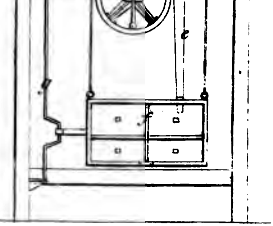


Fig. 2.



W. Newton del.ᵗ

Owen sculp.ᵗ

Bundy's Flax Machinery.

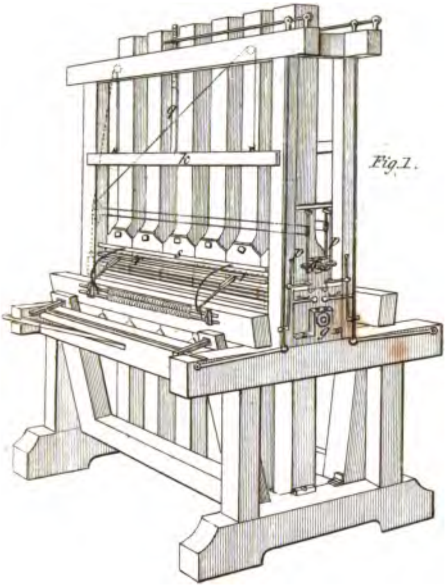


Fig. 1.

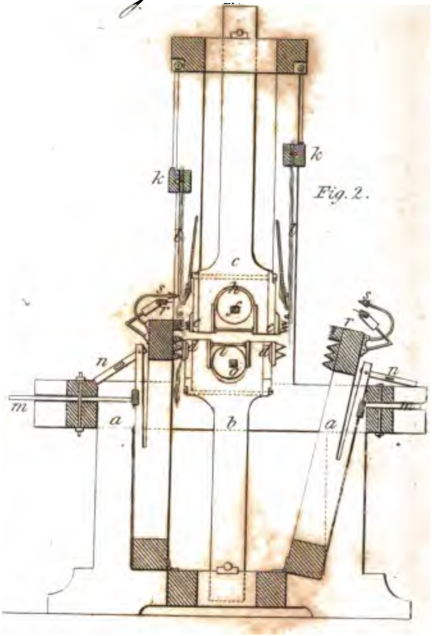


Fig. 2.

Palmer's Calico Printing Machinery.

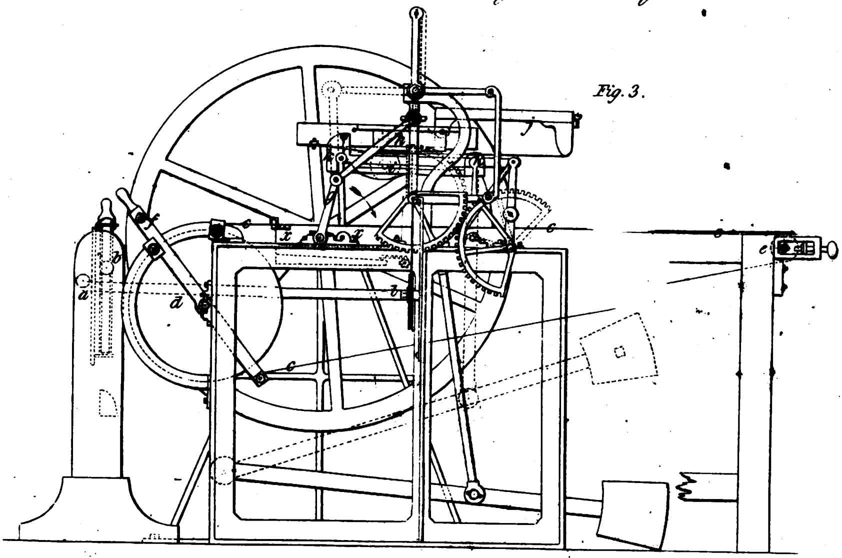


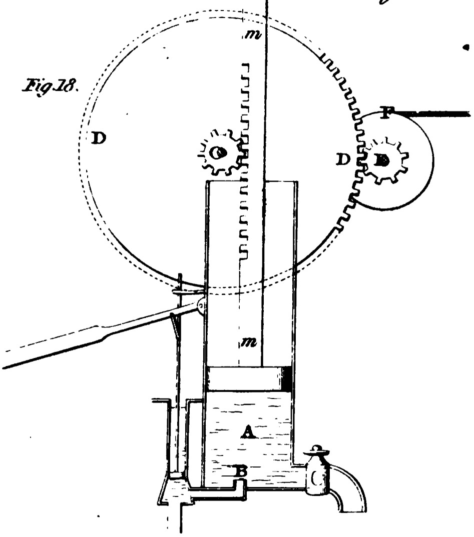
Fig. 3.

W. Newton del.t

S. Bellin sculp.t

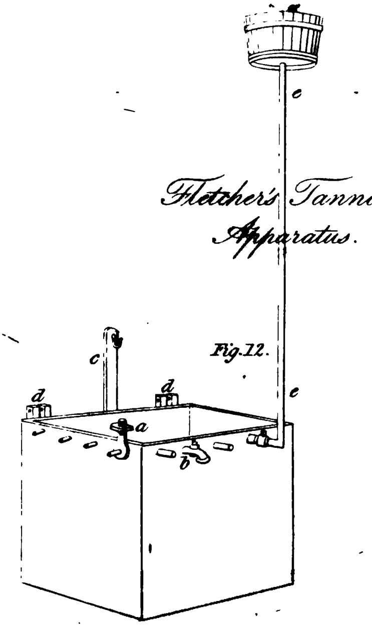
Browne's Hydraulic Preſs.

Fig. 18.



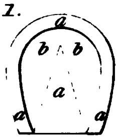
Fletcher's Tannin Apparatus.

Fig. 12.



Dickinson's Horse-shoes.

Fig. 1.



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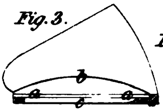
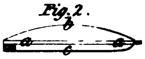


Fig. 2.



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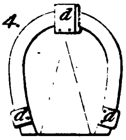

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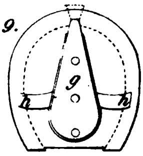

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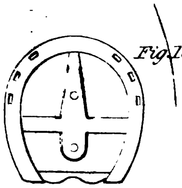

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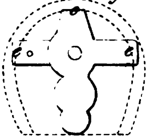
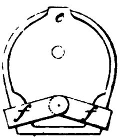


Fig. 6



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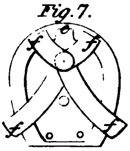

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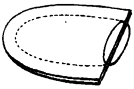

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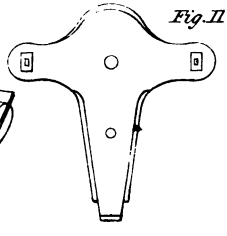


Cercove's Improved Window Shutter.

Fig. 13.

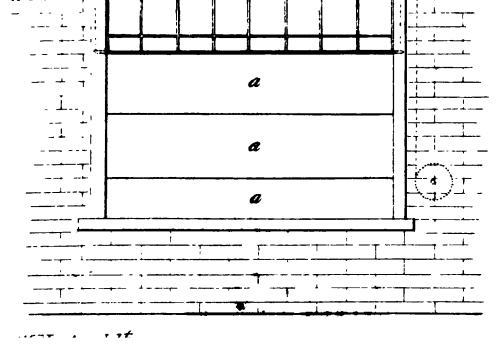
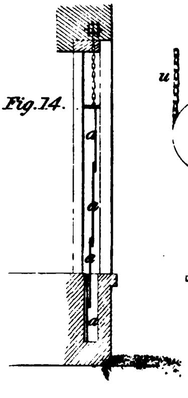


Fig. 14.



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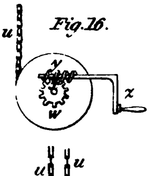
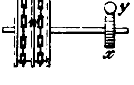
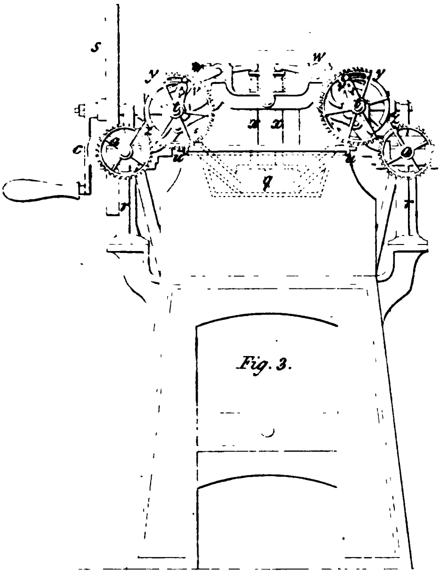


Fig. 15.

Fig. 17.



Henfrey & Applegath's Type founding Apparatus.



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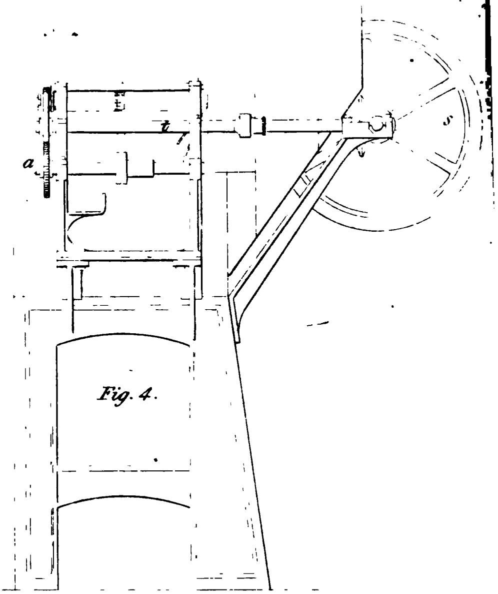
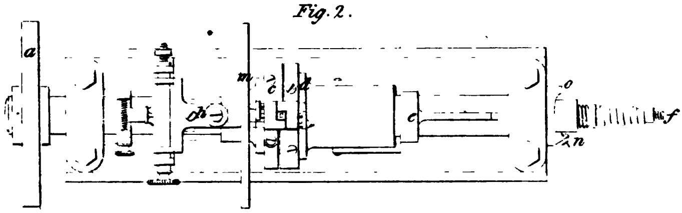


Fig. 4.

Fig. 2.



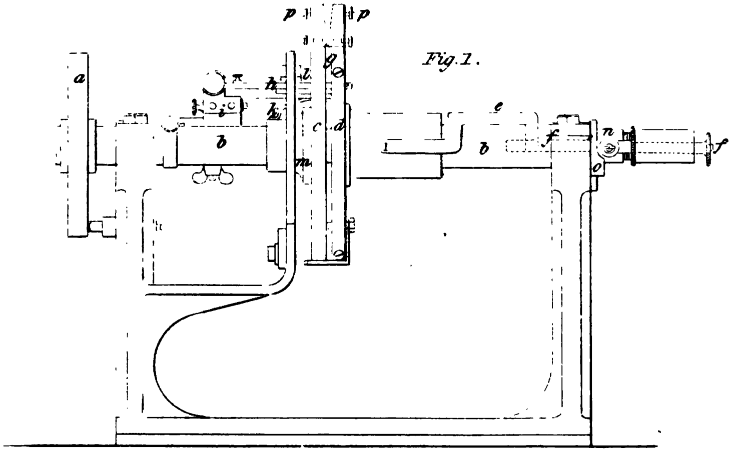


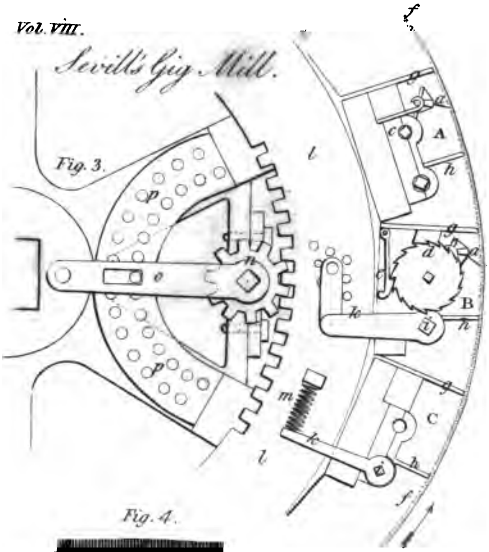
Fig. 1.

W. Newton del.t

G. Gladwin sculp.t

Sevill's Gig Mill.

Fig. 3.



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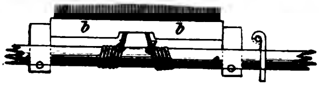
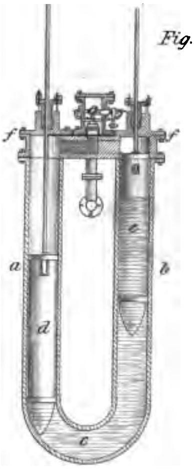


Fig. 1.



Wigston's Steam Engine

Fig. 2.

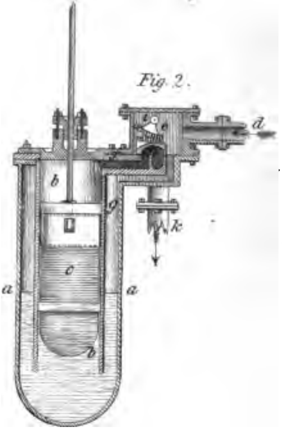
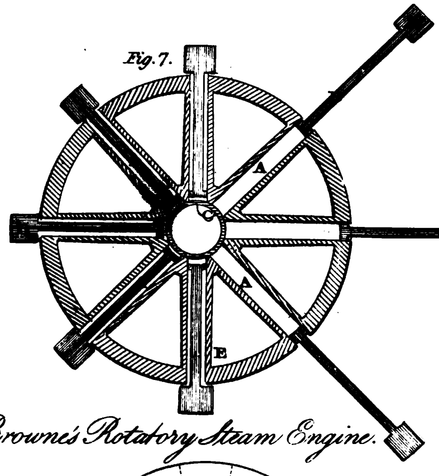
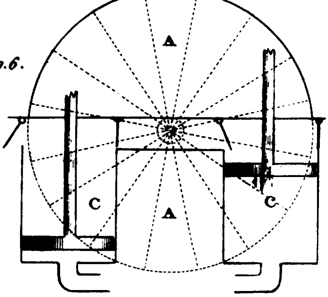


Fig. 7.



Browne's Rotatory Steam Engine.

Fig. 6.



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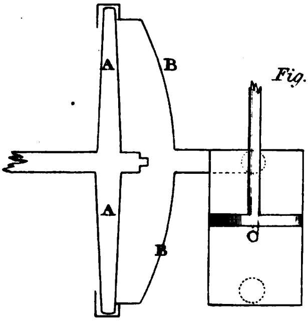
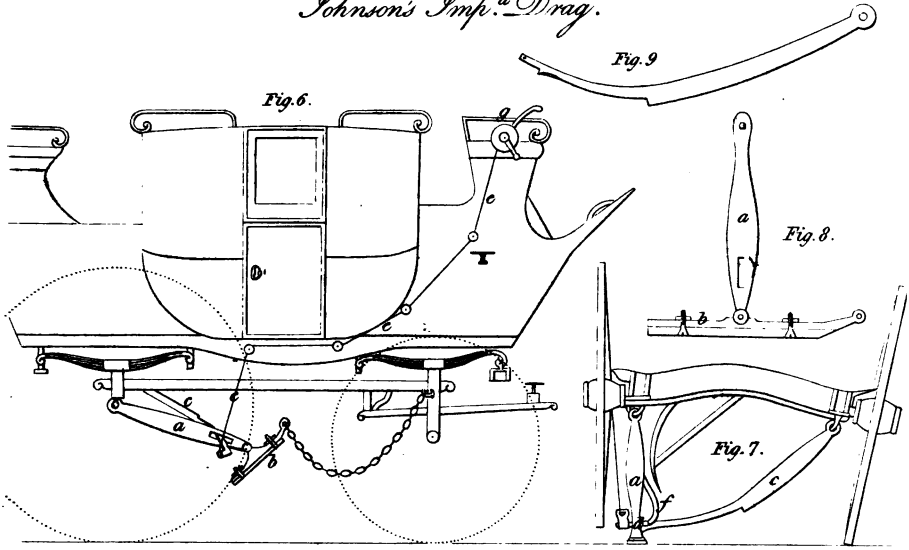
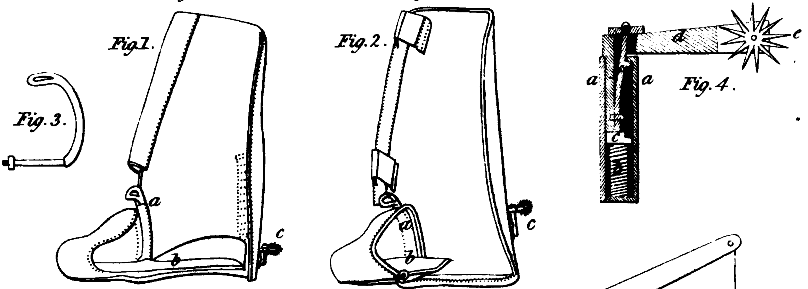


W. Newton del.^{t} S. Bellin sculp.^{t}

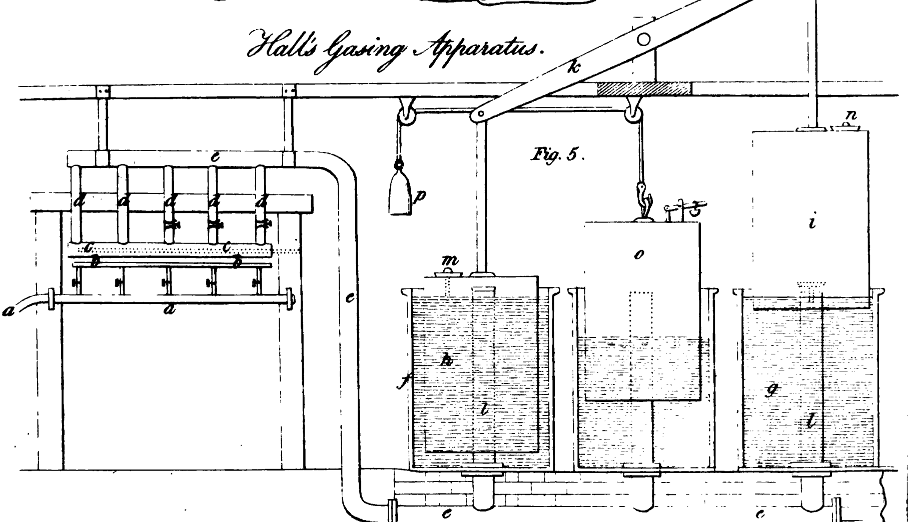
Johnson's Impd. Drag.



Green's Improved Gambadoes.

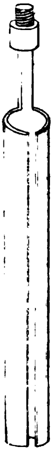


Hall's Gasing Apparatus.



W. Newton delt.

T. C



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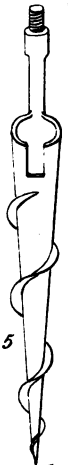

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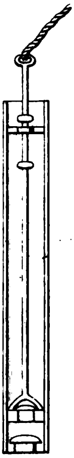

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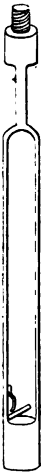

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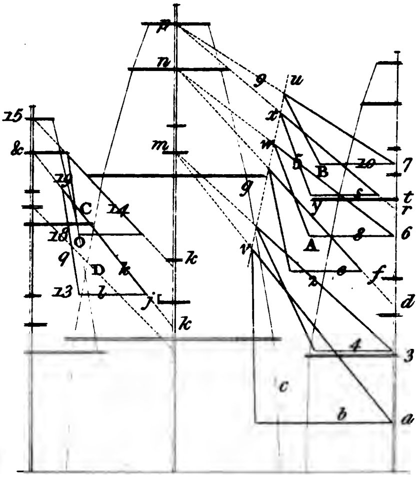
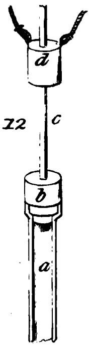


Good's Implements for boring the Earth

Heathcote's Impd. Rigging.



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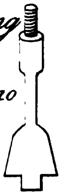

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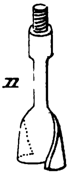

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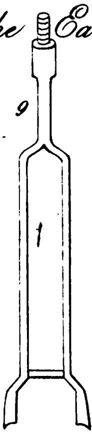

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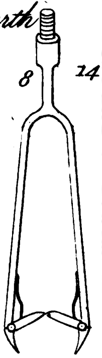

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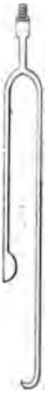

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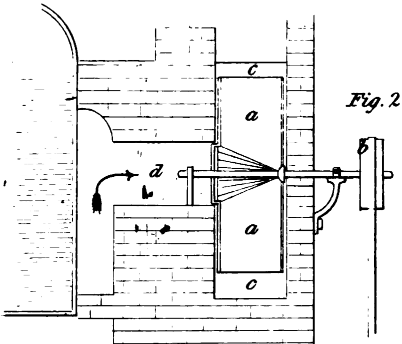
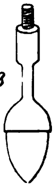


Neville's Furnaces.



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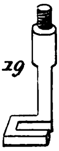

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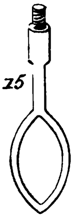

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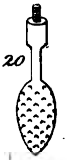

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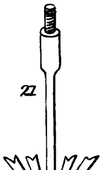

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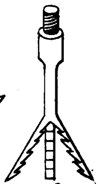

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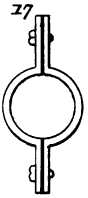

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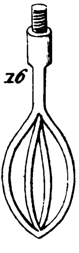

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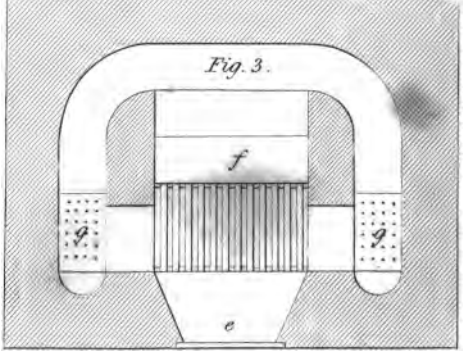


W. Newton delt. G. Gladwin sculpt.

Furnival & Smith's Boiler.

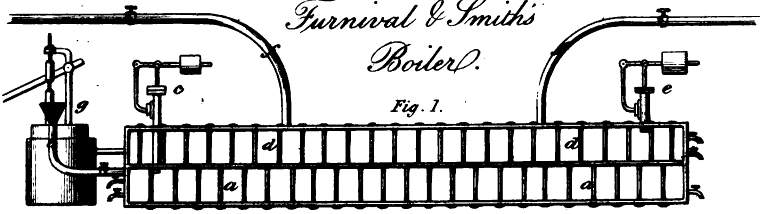


Fig. 1.

Boot's Apparatus for Singing Lace.

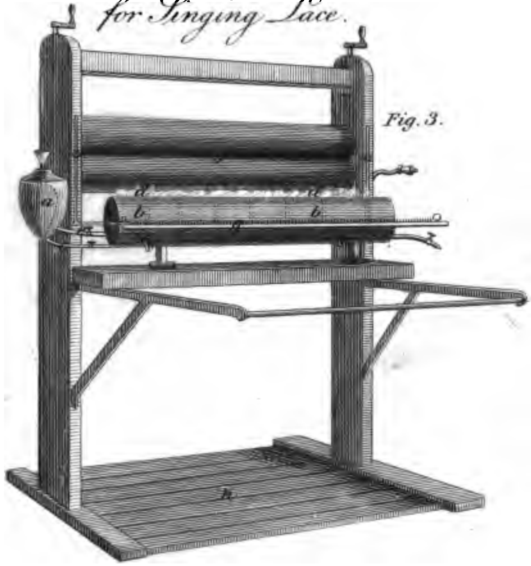


Fig. 3.

Vallances Apparatus for producing Ice.

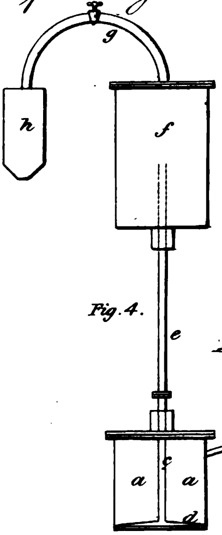


Fig. 4.

Donkin's Apparatus for Singing Lace.

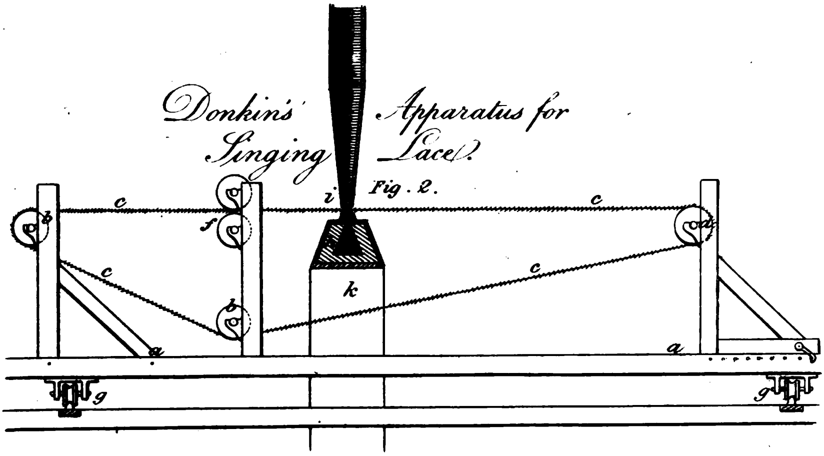


Fig. 2.

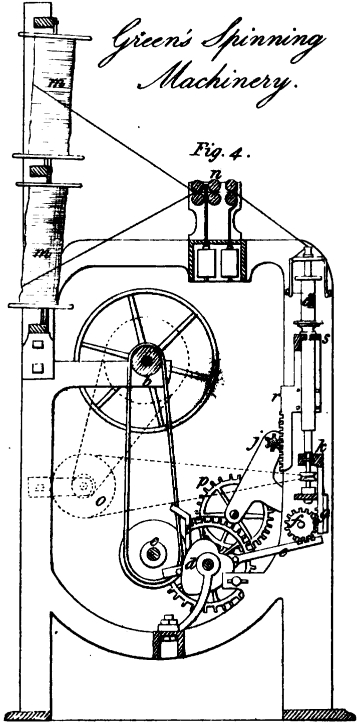
W. Newton del^t

S. Bellin sc.

Warcup's Mangle.

Green's Spinning Machinery.

Fig. 4.



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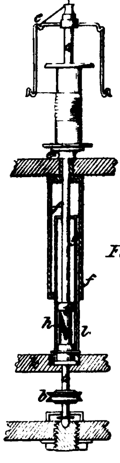


Fig. 3.

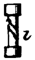
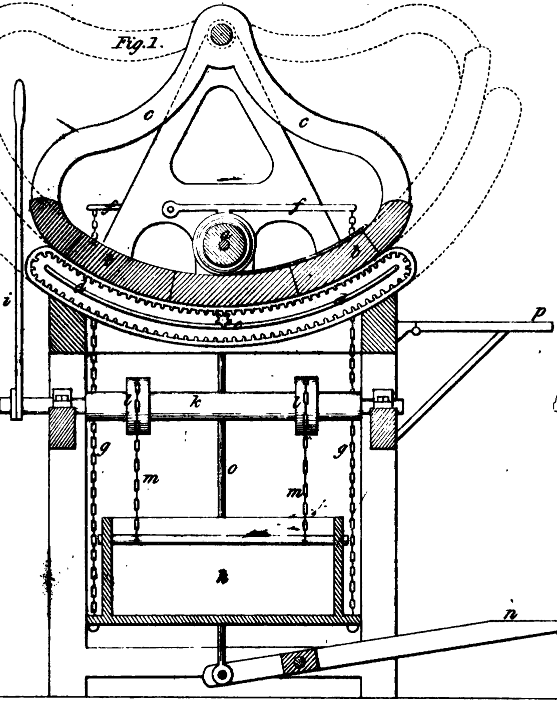
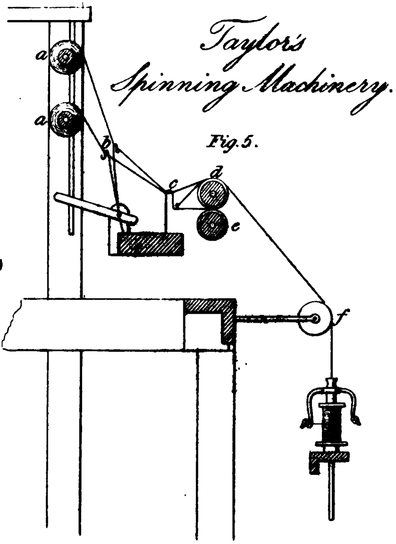


Fig. 1.



Taylor's Spinning Machinery.

Fig. 5.



W. Newton del^t.

G. Gladwin sculp^t.

Southworth's Drying Apparatus.

Fig. 5.

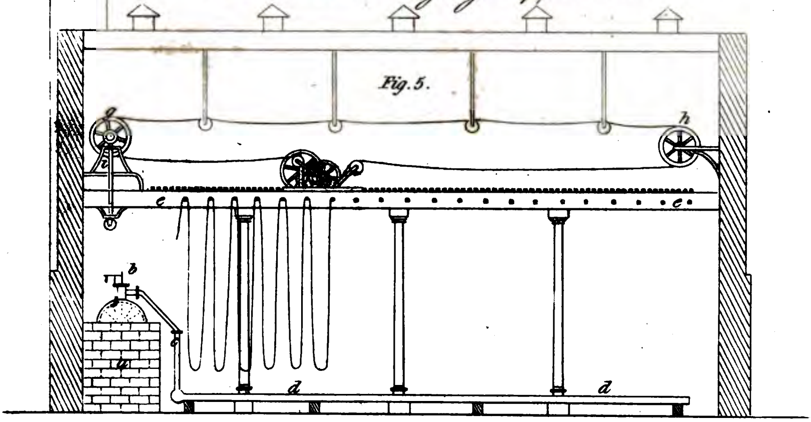


Fig. 6.

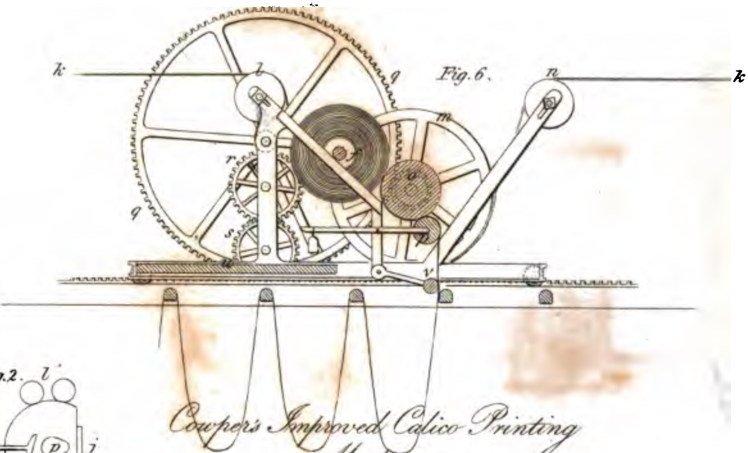
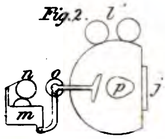


Fig. 2.



Cowper's Improved Calico Printing Machinery.

Fig. 4.

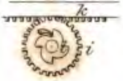
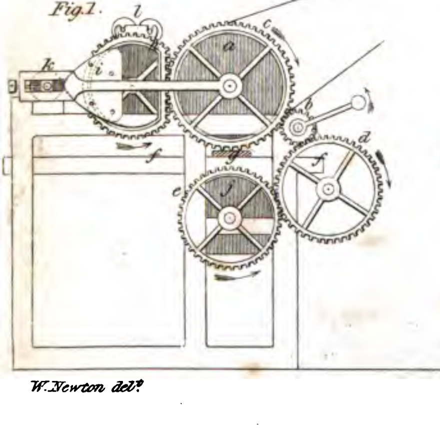


Fig. 1.



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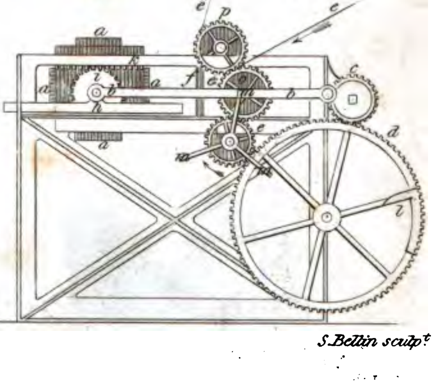
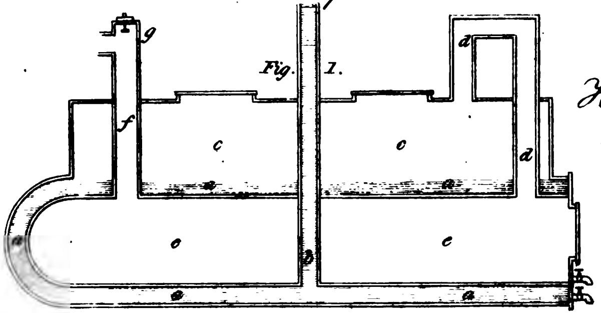


W. Newton del.ᵗ

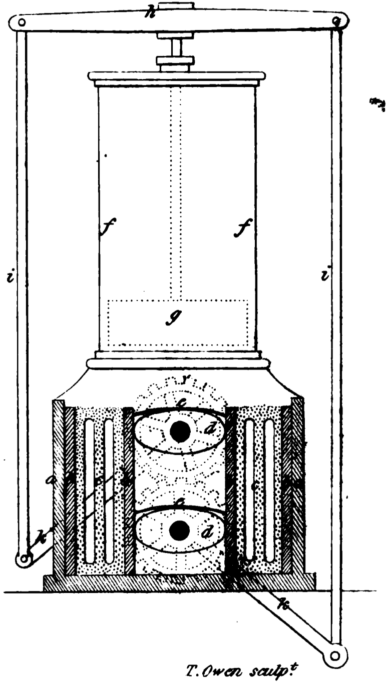
S. Bellin sculp.ᵗ

Fisher & Horton's Impd. Steam Boiler.

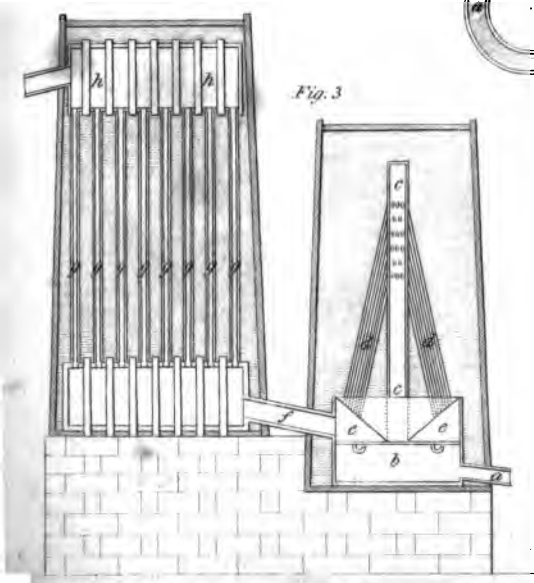


Hall's Preſs for extracting Oil.

Fig. 2.



Winter's Distilling Apparatus.



W. Newton delt.

Ward's Impd. Door Lock.

Fig. 4.

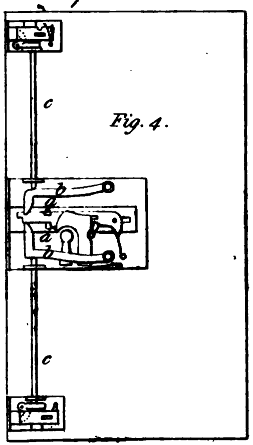
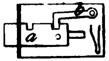


Fig. 5



T. Owen sculpt.